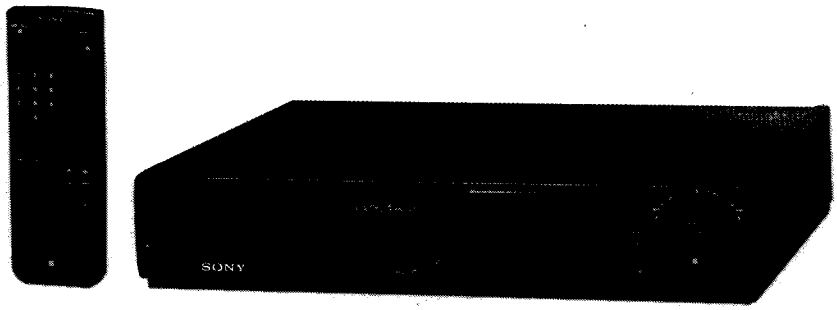
SLV-393
RMT-V102C

SERVICE MANUAL

US Model
Canadian Model
PX Model



Remote commander RMT-V102C is available as a unit. See page 110 for repair parts.

For MECHANICAL ADJUSTMENTS, refer to the "VHS MECHANICAL ADJUSTMENT MANUAL II" (9-972-816-11)

SPECIFICATIONS

System

Format	VHS NTSC standard
Video recording system	Rotary two-head helical scanning FM system
Video heads	Double Azimuth four head
Video signal	EIA standard, NTSC color
Tape speed	SP: 33.35 mm/sec. (1 3/8 inches/second) EP: 11.11 mm/sec. (7/16 inches/second) LP: 16.67 mm/sec (11/16 inches/second) Playback only
Maximum recording/playback time	8 hours in EP mode (with T-160)
Fast-forward and rewind time	Approx. 4 min. 30 sec. (with T-120)
High speed rewind time	Approx. 2 min. 30 sec. (with T-120)

Tuner Section

Channel coverage	VHF channels 2 to 13 UHF channels 14 to 69 CATV channel A-8 to A-1, A to W, W+1 to W+84
Antenna	75 ohm antenna terminal for VHF/ UHF

Inputs and Outputs

LINE IN 1 and 2	VIDEO IN (phono jack) (1 each) Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO IN (phono jack) (1 each) Input level: -7.5 dBs (0 dBs = 0.775 Vrms) Input impedance: more than 47 kilohms
LINE OUT	VIDEO OUT (phono jack) (1) Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative AUDIO OUT (phono jack) (1) Standard output: -7.5 dBs at load impedance 47 kilohms Output impedance: less than 10 kilohms
CONTROL S IN	Minijack (1)

— continued on next page —

MICROFILM

VHS VIDEO CASSETTE RECORDER
SONY®

Timer Section

Clock	Quartz locked
Time indication	12-hour cycle
Timer setting	Only for recording 8 program in one month at max.
Power back up	Built-in self-charging capacitor Back-up duration: Up to one hour at one time

General

Power requirements	120V AC, 60Hz (US, CND) 110–240V AC, 50/60Hz (PX)
Power consumption	28 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	-20°C to 60°C (-4°F to 140°F)
Dimensions	430 x 87 x 363 mm (w/h/d) (17 x 3 1/3 x 14 3/8 inches)
Weight	5.7 kg (12 lb 9 oz)

Wireless Commander RMT-V102C

Remote control system	Infrared control
Command mode	VTR 1/2/3 switchable
Power requirements	3V DC, 2 size AA batteries (IEC designation R6)

Accessories Supplied

Wireless Commander RMT-V102C ..... (1)
Size AA (R6) batteries ..... (2)
75-ohm coaxial cable with F-type connectors ..... (1)
External antenna connector ..... (1)
AC power cord ..... (1)

Design and specifications are subject to change without notice.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
6. Check the B+ voltage to see it is at the values specified.
7. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

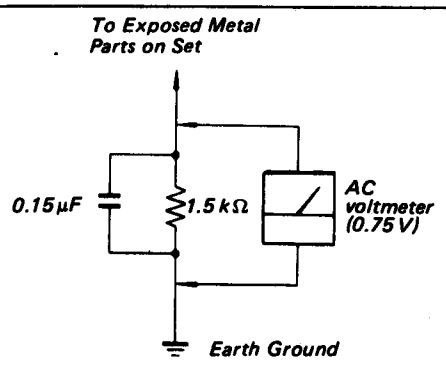


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

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SECTION 1
GENERAL

This section is extracted from instruction manual.

Precautions

On Safety

- Operate the unit only on 120V AC, 60 Hz.
- Should anything fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- One blade of the plug is wider than the other for the purpose of safety and will fit into the power outlet only one way. If you are unable to insert the plug fully into the outlet, contact your dealer.
- Unplug the unit from the wall outlet if you will not use it for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

On Installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- Do not install it in an inclined position. The unit is designed for operation in a horizontal position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as microwave ovens or large loud speakers.
- Do not place any kind of heavy object on the unit.

On Operation

- When the unit is not in use, turn the power off to conserve energy and to extend the life of the unit.
- Remove and store video cassettes after recording or playback.

On Cleaning

- Clean the cabinet, panel and controls with a dry, soft cloth, or a soft cloth slightly moistened with a mild detergent solution.
- Do not use any type of solvent, such as alcohol or benzine, which might damage the finish.

If you have any questions about this unit, contact your Sony dealer or a qualified technician.

Introduction

How to Use This Manual

This manual is arranged to help you quickly find the information you need for the operation of the SLV-393. This manual is divided into five chapters. The chapters and their contents are as follows.:

Preliminaries (page 4)
Getting Started (page 10)
Basic Operations (page 18)
Advanced Operations (page 36)
Additional Information (page 48)

For information about the VCR's basic operations, such as Playback (page 18), Recording TV programs (page 26), or Timer Recording (page 28), see the chapter Basic Operations. If you are already familiar with the basic operations, see the chapter, Advanced Operations. If you have any problems in operating the VCR, refer to the Troubleshooting section. If your unit is in need of repair, contact your local Sony service facility.

Conventions of this manual

This manual mainly explains operations using the VCR Remote Commander. However, the buttons on the VCR with the same name or mark as those on the Remote Commander function are exactly the same as those on the Remote Commander.

When you are reading through the manual, remember that:

- In the text of this manual, buttons and switches are shown in capital letters:
  Example: Press PLAY.
- Numbers in the illustrations correspond to numbers in the text. Using the button on the VCR with the same name instead of the button of the Remote Commander, you can also control the VCR.
- The arrow ⏎ indicates signal flow.
- Notes are enclosed in boxes.

Unpacking

Check that the following accessories are in the carton with your unit:

- Remote Commander RMT-V102C (1)
- Size AA (R6) batteries (2)
- External antenna connector (1)
- 75-ohm coaxial cable with F-type connectors (1)
- AC power cord (1)

Overview of the VCR

For editing

- **DUAL MODE SHUTTLE ring**
  Allows easy operation, quick access to the desired scene and playback in various speeds in forward and reverse directions.
- **CONTROL S INPUT jack**
  Allows remote control of this VCR by other Sony video equipment with a CONTROL S OUTPUT jack.
- **Input connectors on the front panel**
  Offers easy connection to a video camera recorder.

On-screen displays

- **Data screen**
  Tape counter, tape speed, operation mode, and remaining tape length are displayed on the TV screen.
- **AUTO MENU display**
  Allows you to preset automatic tape transport functions.
- **TIMER SET/CHECK display**
  Timer recording settings can be set and checked by referring to the TV screen.

Convenient functions

- **Auto tracking function**
  Automatically adjust the tracking condition for maximum picture quality.
- **Timer recordings of 8 programs over a month**
  Recording of up to eight TV programs can be preset as much as one month in advance.
- **Index function**
  The beginning of a desired scene can be located easily with the index mark/index search function.
- **Auto head cleaner**
  Cleans the video heads each time a cassette is loaded or unloaded

High quality picture

- **High quality (HQ) picture**
  The SLV-393 provides a sharp, finely detailed picture through High Quality (HQ) picture technology.
  HQ A video cassette recorder (VCR) with this marking incorporates VHS high-quality picture technology and is compatible with any video cassette recorder bearing the VHS mark.

Connecting a TV

This chapter describes how to connect your VCR to your TV to watch the playback picture on the TV screen and to receive TV programs on the VCR.

Before making the connections, check the following points

- Turn off the power to the VCR and the TV.
- Do not connect the AC power cords until all of the connections are completed.
- Make connections firmly. Loose connections may cause picture distortion.
- **If your TV does not match the example below**
  Consult your nearest Sony dealer or qualified technician.

When the connections are completed
Read "Setting the RF unit" to view the playback picture of the VCR on the TV on page 8.

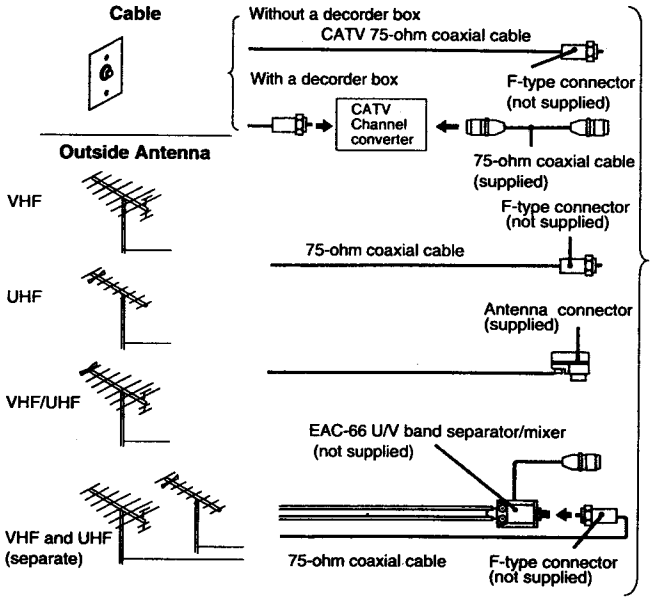
How to attach the U/V band separator/mixer, the antenna connector and the F-type connector
See page 9.

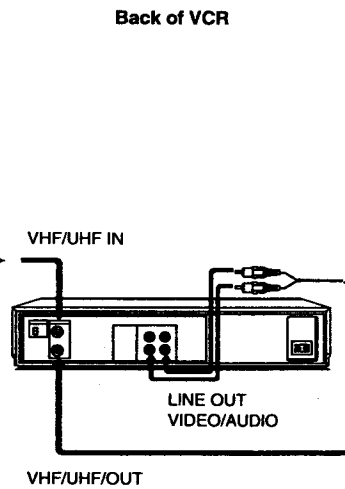
Connecting Antenna or Cable to the VCR

How you connect an antenna to the VCR depends on the type of antenna you have.
Before doing steps 1-3, check to see if you have:

- a cable system
- an outside antenna

1 Find the type of antenna or cable you have in the illustration below. **2 Find the type of antenna or cable connector you are using.** **3 Attach the connector to the VHF/UHF IN terminal on the back of the VCR.**



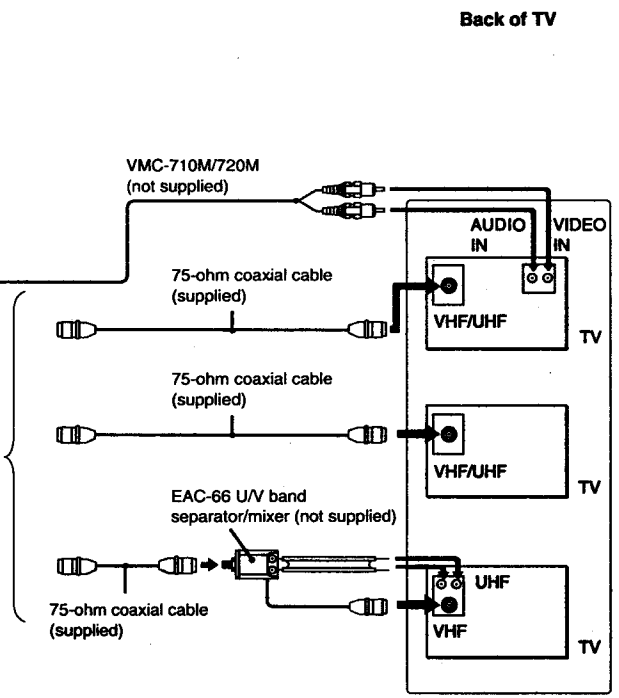


Connecting the VCR to a TV

How you connect your VCR to your TV depends on the type of TV you have.
Before doing step 4-6, check to see if your TV has:

- audio/video input jacks
- a 75-ohm VHF/UHF antenna terminal
- VHF and UHF separate antenna terminals

4 Find the type of antenna terminals or audio/video jacks you have on the back of your TV. **5 Attach the connector(s) you are using to the back of the VCR using the illustration shown below.** **6 Attach the other end of the connector(s) to the back of the TV.**



Setting the RF unit

Why this setting is necessary
Your TV receiver must be set to receive the signal from your VCR. To get the proper RF signal, set the RF UNIT selector switch on the rear panel of the VCR. If channel 4 is active in your area, set the switch to CH 3, and vice-versa. If you connect a color monitor or TV equipped with video/audio input jacks, you do not need to make this setting.

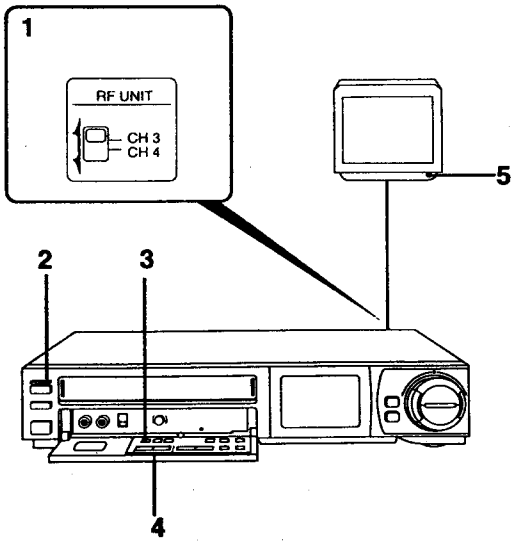
1 **Set the RF UNIT at the VCR to CH 3 or CH 4, whichever is not active in your area.**

2 **Press POWER.**
The indicator will light.

3 **Press TV/VTR so that the VTR indicator lights.**

4 **Check that the TUNER indicator appears in the display window, then select an active channel in your area by pressing CHANNEL +/–.**

5 **Turn on the TV and set the TV to the channel selected in step 1.**
The TV program selected on the VCR will appear on the screen.

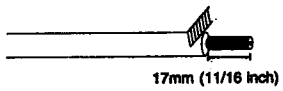


Your TV is now tuned to the VCR. Whenever you use the VCR, set the TV to the channel selected above.

Note
For details about the TV channel adjustment, see the instruction manual of the TV.

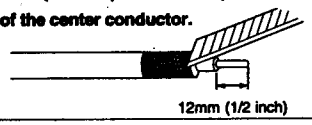
How to Attach the F-type Connector (not supplied)

1 **Strip 17 mm (11/16 inch) of the black polyvinyl jacket.**

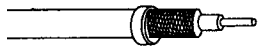


2 **Fold back the woven wire.**

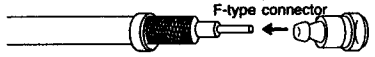
3 **Strip 12 mm (1/2 inch) of the white plastic leaving 12 mm of the center conductor.**



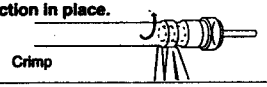
4 **Slip the crimping ring over the cable.**



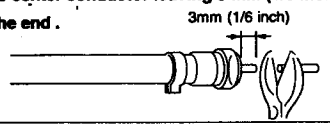
5 **Insert the inner conductor into the F-type connector shaft and push the end of the cable into the connector as far as it will go**



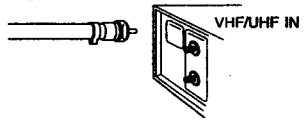
6 **Slide the crimping ring over this assembly. Then pinch the crimping ring with pliers to hold the connection in place.**



7 **Cut the center conductor leaving 3 mm (1/6 inch) from the end .**



8 **Insert the F-type connector into VHF/UHF IN on the VCR.**

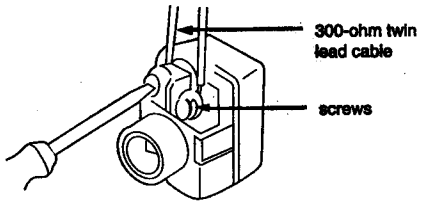


How to Attach the External Antenna Connector (supplied)

1 **Loosen the screws on the antenna connector.**

2 **Fit the 300-ohm twin lead cable on the UHF antenna under the screws on antenna connector.**

3 **Tighten the screws again.**



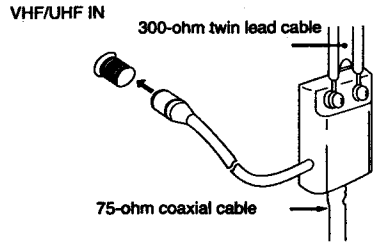
How to Attach the EAC-66 U/V Band Separator/ Mixer (not supplied)

1 **Loosen the screws on the U/V band separator/mixer.**

2 **Fit the 300-ohm twin lead cable on the UHF antenna under the Screws.**

3 **Connect the 75-ohm coaxial cable to the U/V band separator/mixer.**

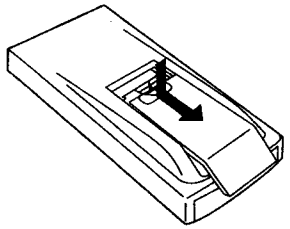
4 **Connect the U/V band separator/mixer to the VHF/UHF IN on the VCR.**



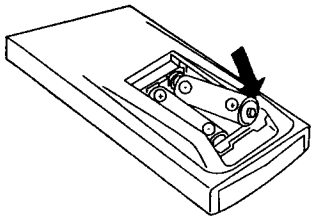
Preparing the Remote Commander

Inserting Batteries

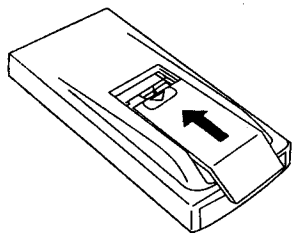
1 Open the lid.



2 Insert two size AA (IEC designation R6) batteries with the polarity lined up correctly.



3 Close the lid.

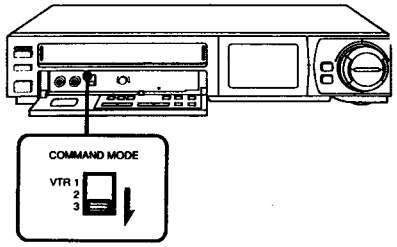


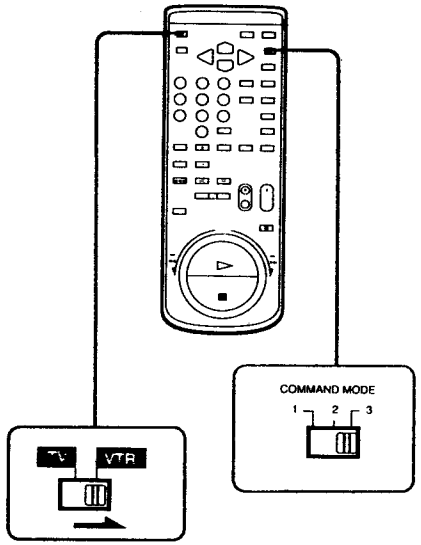
Notes on the handling of batteries

- With normal use, the batteries will last for approximately 6 months.
- If you do not use the Commander for a long period of time, remove the batteries to avoid possible damage from battery leakage.

Setting the Command Mode

You can select three different setting positions for Command Mode setting.





1 Set the COMMAND MODE VTR 1/VTR 2/VTR 3 selector on the VCR to the "VTR 3" position.

2 Set the COMMAND MODE VTR 1/2/3 selector on the Remote Commander to the "3".

3 Set the TV/VTR remote control selector to VTR.

Controlling Other Sony Video Equipment
If other Sony video equipment has a COMMAND MODE selector

1 With the COMMAND MODE 1/2/3 selector on the Remote Commander, select a setting position (for instance, VTR 1) different from the position you have selected for this VCR.

2 Set the COMMAND MODE selector of other video equipment to the same position that you have selected in step 1.

If other Sony video equipment does not have a COMMAND MODE selector
You can control other Sony video equipment by changing the setting of the COMMAND MODE VTR 1/2/3 selector on the Remote Commander as follows:

Infrared remote controlled Sony Betamax VCRs (Some of them may not be controlled in this mode.) : VTR1

Sony 8 mm format VCRs : VTR 2

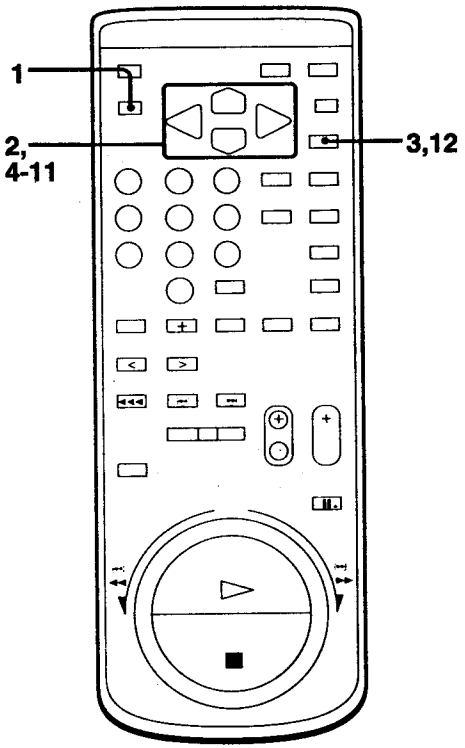
Sony VHS format VCRs : VTR 3

Setting the Date and Time

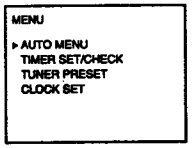
You can set the date and clock of the VCR using the Remote Commander and the on-screen displays on your TV screen. Note that 12:00 AM is midnight and 12:00 PM is noon.

Date and Time Setting Example

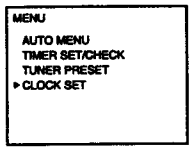
Example: To set to 3:32 pm, July 4, 1992



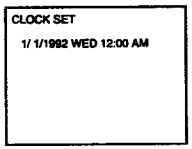
1 Press MENU.
The main menu appears.



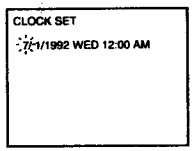
2 Press ▼ or ▲ to move cursor (▶) to CLOCK SET.



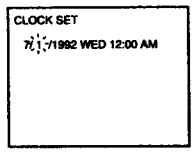
3 Press EXECUTE.
"1/1 1992 WED 12:00 AM" is displayed.
The left most 1, in the "month" position, flashes.



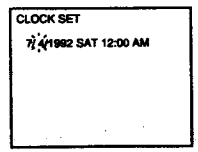
4 Press ▲ or ▼ until 7 appears in the month position.



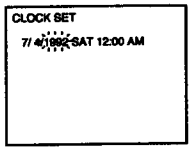
5 Press ▶ to make the next number, in the "day" position flash.



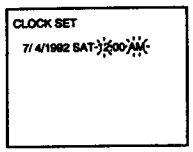
6 Press ▲ or ▼ until 4 appears in the day position.
The day of the week is automatically set.



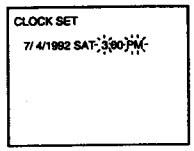
7 Press ▶ to make the year flash and press ▲ to change the year if necessary.



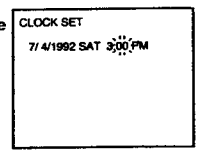
8 Press ▶ to make the time flash.



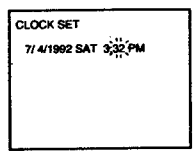
9 Press ▼ or ▲ until 3 PM appears.



10 Press ▶ to make the minute flash.



11 Press ▼ or ▲ until 32 appears in the minute position.



12 Press EXECUTE simultaneously with a time signal.
Pressing EXECUTE will set the clock to 3:32 pm 00 seconds.

To check the date and clock on the screen
Select CLOCK SET in the main MENU and press EXECUTE.

Notes
- Set the clock except during timer-activated recording, timer-activated recording standby, quick timer recording.
- When the date and clock are displayed on the screen, the clock keeps running as long as no modification is made.
  The seconds are not reset to 00 when you return to the original screen.

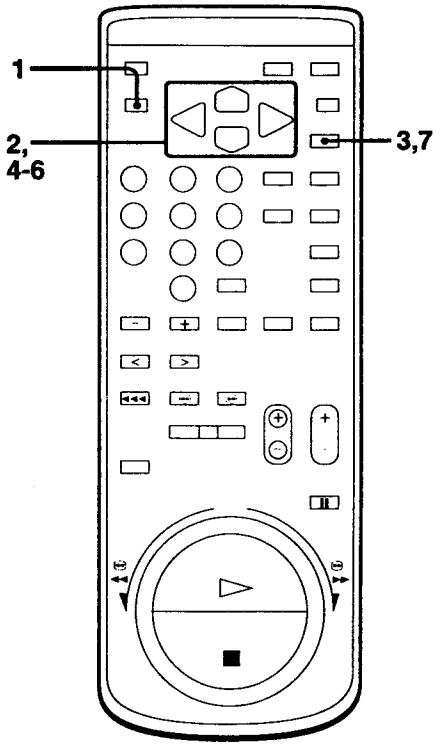
Presetting the Active Channels

This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69, or CATV channels 1 to 125. These channels can be preset using the Commander and the TUNER PRESET display. First, we recommend that you preset the active channels in your area using the automatic preset mode. Then, if there are any unwanted channels, delete them manually. If you've already decided which channels you wish to preset on the VCR, set them directly by using the channel number buttons.

Before presetting channels, check the following points.

- Turn on the VCR and the TV.
- If you've connected the TV and the VCR using the VHF/UHF OUT on the VCR only, make sure that the TV is set to the correct channel (3 or 4) for the VCR.
- Press TV/VTR to display the VTR indicator.
- Press INPUT SELECT so that the TUNER indicator and channel number appear in the display window.

Presetting All Receivable Channels Automatically



1 Press MENU.

The main menu appears.

```
MENU
▸ AUTO MENU
  TIMER SET/CHECK
  TUNER PRESET
  CLOCK SET
```

2 Press ▲ or ▼ to move the cursor (▶) to TUNER PRESET.

```
MENU
  AUTO MENU
  TIMER SET/CHECK
▸ TUNER PRESET
  CLOCK SET
```

3 Press EXECUTE.

The TUNER PRESET display appears.

```
TUNER PRESET              1CH
▸ NORMAL/CATV  NORM • CATV
  AUTO PRESET
  MANUAL SET   • ADD ERASE
  AFT          • ON  OFF
  FINE TUNING
```

4 Press ▲ or ▼ to move the cursor to NORMAL/CATV.

```
TUNER PRESET              2CH
▸ NORMAL/CATV • NORM CATV
  AUTO PRESET
  MANUAL SET  • ADD ERASE
  AFT         • ON  OFF
  FINE TUNING
```

5 Use ◀ or ▶ to select NORM to preset VHF and UHF channels.
Select CATV to preset cable TV channels.

The lowest channel number, 2 for NORM and 1 for CATV will appear on the screen.

```
TUNER PRESET              2CH
▸ NORMAL/CATV • NORM CATV
  AUTO PRESET
  MANUAL SET  • ADD ERASE
  AFT         • ON  OFF
  FINE TUNING
```

6 Press ▲ or ▼ to move the cursor to AUTO PRESET.

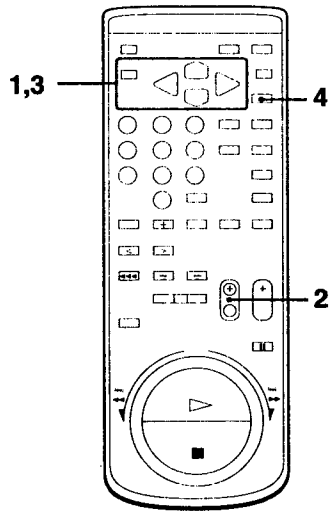
```
TUNER PRESET              2CH
  NORMAL/CATV • NORM CATV
▸ AUTO PRESET
  MANUAL SET  • ADD ERASE
  AFT         • ON  OFF
  FINE TUNING
```

7 Press EXECUTE.

Receivable channels preset in numerical sequence.
When no more channels can be found, the presetting stops and the picture of the lowest numbered channel is displayed in the display window.

```
TUNER PRESET              2CH
  NORMAL/CATV • NORM CATV
▸ AUTO PRESET
  MANUAL SET  ADD • ERASE
  AFT         • ON  OFF
  FINE TUNING
```

Presetting Desired Channels or Erasing Unwanted Channels



1 Follow steps 1 to 3 in "Presetting All Receivable Channels Automatically."

2 After automatic presetting is over, press CHANNEL +/– to select the channels to be erased and press channel number buttons to select the channels to be added.

3 To add channels:
Select channel using 0 to 9 and ENTER keys then select ADD.
To erase channels:
Select ERASE.

```
TUNER PRESET              2CH
  NORMAL/CATV • NORM CATV
  AUTO PRESET
▸ MANUAL SET  • ADD ERASE
  AFT         • ON  OFF
  FINE TUNING
```

4 Press EXECUTE.

When pressing CHANNEL +/–, the erased channels are skipped and the added channels are displayed.

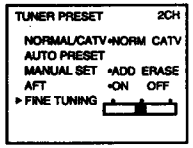
Fine-tuning

Normally the AFT (Auto Fine Tuning) setting is set to ON, and the AFT function fine-tunes the picture. If the picture of a particular channel is not acceptable, fine-tune it manually.

1 Call up the TUNER PRESET display referring to steps 1 to 3 in "Presetting All Receivable Channels Automatically." See page 14.

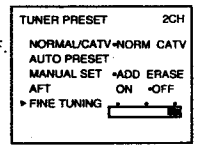
2 Press ▲ or ▼ to move the cursor to FINE TUNING.

The fine tuning indicator appears.

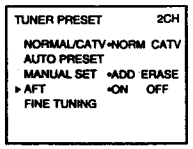


3 Press ◀ or ▶ to get a clearer picture.

The AFT ON/OFF automatically switches to OFF.



4 Press ▲ to move the cursor to AFT and select ON if you cannot get a better picture.



5 Press EXECUTE.

About the FINE TUNING indicator

The FINE TUNING indicator shows the operable fine-tuning range. When the VCR's tuner is receiving a broadcast signal in the best condition, the indicator will be at the center position or within one space right or left of the center position. However, even when a broadcast is received in the best condition, there may be cases when the indicator will not be at the position explained above.

Cable TV Channel Assignment

Cable TV systems use letters or numbers to designate the channels. To tune-in a CATV channel, refer to the chart below which shows the CATV channel numbers on this VCR and the corresponding CATV channel. Note that the channel number assignment shown in the chart may not correspond to the channel number used by your local cable company. Check with your local cable TV company for more information on the available channels.

Number on this VCR	1	2	...	13	14	15	16	17	18
Corresponding CATV channel	A-B	2	...	13	A	B	C	D	E

19	20	21	22	23	14	25	26	27	28	29	30	31	32
F	G	H	I	J	K	L	M	N	O	P	Q	R	S

33	34	35	36	37	...	94	95	96	97	98	99
T	U	V	W	W+1	...	W+58	A-5	A-4	A-3	A-2	A-1

100	...	125
W+59	...	W+84

This VCR is designed to correspond to the Standard cable system. However, the cable TV services may vary from area to area. Your local cable TV company may adopt either the HRC*1 or IRC*2 cable system. Even in these cases, this VCR is capable of receiving either of these cable systems in the best condition.

*1 HRC (Harmonic Related Carriers)
All channels except for 5 and 6 are 1250 kHz lower than the Standard cable system. Channels 5 and 6 are 750 kHz higher than the Standard cable system.

*2 IRC (Incremental Related Carriers)
All channels except for 5 and 6 are the same as the Standard cable system. Channels 5 and 6 are 2000 kHz higher than the Standard cable system.

FINE TUNING indication when receiving HRC or IRC cable systems

Even when the signals are received in the best condition, the FINE TUNING indicator will not stay at the center position for channels higher or lower than the Standard cable system because of the difference in the frequency.

Note

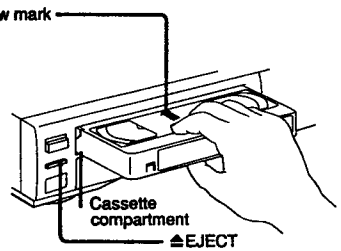
Pay cable TV systems use scrambled or encoded signals and require special converters (decoders) in addition to the normal cable connection.

Playback

In this section, the operations and functions related to tape playback are explained.

Putting in a Video Cassette

1 Put in a video cassette with the arrow mark facing upwards.

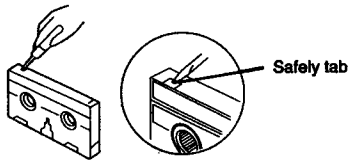


2 Gently press the center of the front side of the cassette until the mechanism draws it into the compartment.
When the cassette has been loaded, the cassette indicator (⊡) lights in the display window of the VCR and the VCR turns on automatically.

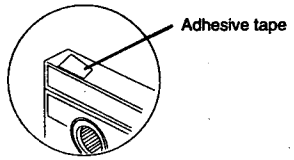
Note
If you put in a cassette without a safety tab, playback starts automatically (AUTO PLAYBACK function).

Ejecting the cassette
Press ≜EJECT on the VCR.
You can eject the cassette when the power is off. When you press ≜EJECT, the power is turned on. After ejecting the cassette, the power is off again.

Protecting your cassette against accidental erasure
The cassette is provided with a safety tab to protect against accidental recording.
Break off the safety tab with a screwdriver or other suitable tool.
If the safety tab is removed, the cassette will be ejected when you try to record on the cassette.



To record on a cassette with the safety tab broken off, simply cover the tab hole with adhesive tape.

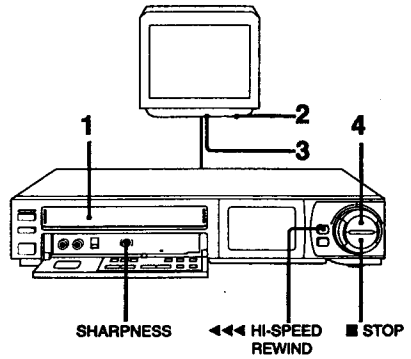


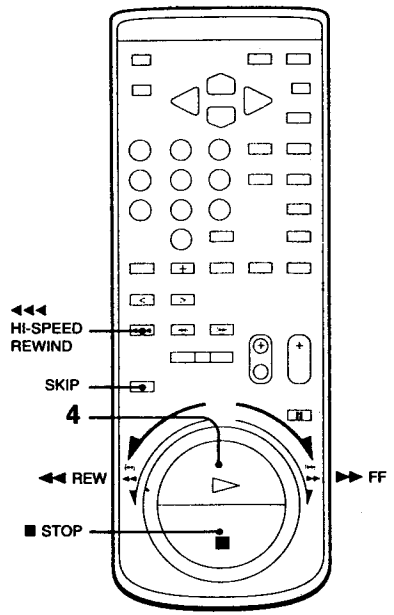
Maximum recording time of a tape
Recording in the SP or EP mode is possible with this unit. When recording, select the desired recording mode (SP or EP) with TAPE SPEED on the Commander or the unit. During playback, the unit automatically detects the recording format, and then plays back the tape in the appropriate mode. A tape recorded in the EP mode runs three times as slowly as a tape recorded in the SP mode. Refer to the chart below for the recording/playback time available in each mode.

Cassette tape	Recording/playback time	
	SP mode	EP mode
T-160	2 hr.40 min.	8 hr.
T-120	2 hr	6 hr.
T-60	1 hr.	3 hr.
T-30	30 min.	1 hr. 30 min.

Tapes recorded in LP mode
Playback of tapes recorded in LP mode is also possible with this VCR. However, playback in modes other than normal forward speed is not guaranteed.
This VCR is not designed to record in the LP mode.
Note that the AUTO TRACKING function does not function.

Playing Back a Cassette





1 Put in a cassette.

2 Turn on the TV.

3 If your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR
Select the input for the VCR.
If your TV is connected only to the VHF/UHF OUT on the VCR
Select the channel for the VCR (CH 3 or CH 4).

4 Press ▷PLAY.

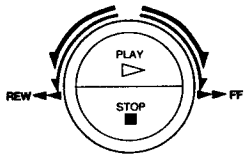
Continued ▶

To stop playback
Press ■STOP.

To stop playback for a moment
Press ❚❚PAUSE. To resume playback, press ▷ play or ❚❚PAUSE.

To advance the tape rapidly
During stop mode:
Turn the DUAL MODE SHUTTLE ring to the right (▶▶).

To rewind the tape
During stop mode:
Turn the DUAL MODE SHUTTLE ring to the left (◀◀).



To rewind the tape at high speed
Press ◀◀◀HI-SPEED REWIND.

To rewind the tape to its beginning and to playback automatically (Auto Playback Function)
Press ▷PLAY while turning the DUAL MODE SHUTTLE ring to the left (◀◀).
Or Press ▷PLAY while depressing ◀◀◀HI-SPEED REWIND.
During rewinding the tape, the AUTO indicator lights in the display window.

You cannot use the Remote Commander for the auto playback function.

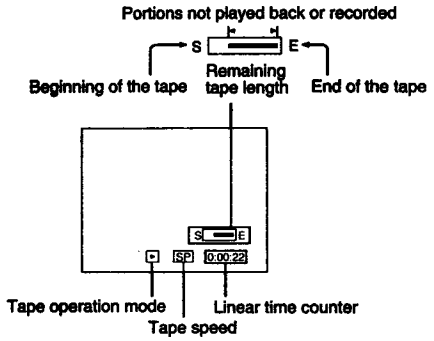
To get a sharper picture
Turn the SHARPNESS control toward SHARP.

To get a softer picture
Turn the SHARPNESS control toward SOFT.

When the tape is played back to the end
The tape is automatically rewound to the beginning (auto rewind). The power remains on.

About the Data Screen

To erase or call up the data screen on the display, press DATA SCREEN on the Commander.

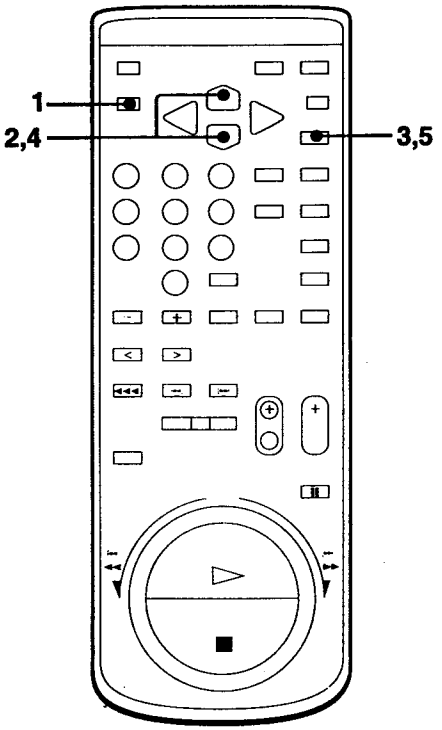


Notes
- The remaining tape length displayed is approximate. Therefore, use it only as an approximate reference. When you insert a short tape such as T-20, T-30 or a non-standard commercially available tape, this indicator may not function correctly.
- The data screen display cannot be called up on the screen during still mode, slow motion playback.

Presetting the Automatic Functions - Auto Play

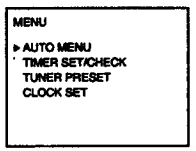
You can use the AUTO PLAY feature of your VCR to select from a menu of options that will automate many of the operations you normally perform manually. You can use this feature to set up your VCR to, for example, automatically rewind a tape when it reaches the end, and then eject the cassette and shut off the VCR.
(See page 22 for complete descriptions of the available options.)

Operation

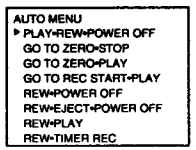


1 **Press MENU when the VCR is in the stop mode.**

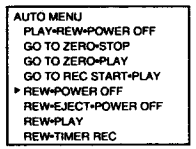
2 **Press ▲ or ▼ to move the cursor to AUTO MENU.**



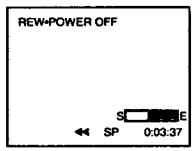
3 **Press EXECUTE.**
The AUTO MENU display appears.



4 **Press ▲ or ▼ to move the cursor to the desired tape operation.**



5 **Press EXECUTE.**
The selected tape operation starts.
The selected tape operation mode is indicated on the screen for several seconds and the AUTO indicator appears in the display window.



To return to the previous screen without making any selection from the AUTO MENU
Press MENU.

When the power is turned off
The cursor will stay at the last position it was set to.

Note on the auto play operation
You can preset the auto play operation only when the VCR is in the stop mode.

Continued ▶

What does each operation indicator mean?

PLAY - REW - POWER OFF

The tape is played back to its end and rewound to its beginning.
Then the power is turned off.

GO TO ZERO - STOP

The tape is fast-forwarded/rewound to the counter zero position, and stops.
See "Tape Return" (page 24) for detailed operation.

GO TO ZERO - PLAY

The tape is fast-forwarded/rewound to the counter zero position, and then is played back.
See "Tape Return Play" (page 24) for detailed operation.

GO TO REC START - PLAY

The tape is fast-forwarded/rewound to the starting point of the recording and is played back.

REW - POWER OFF

The tape is rewound to its beginning and the power is turned off.

REW - EJECT - POWER OFF

The tape is rewound to its beginning and the cassette is ejected.
Then the power is turned off.

REW - PLAY

The tape is rewound to its beginning and then is played back.

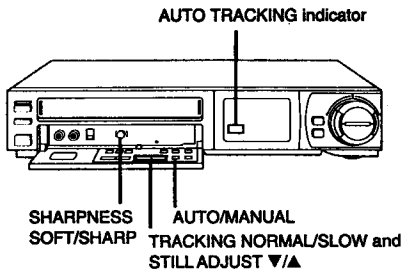
REW - TIMER REC

The tape is rewound to its beginning and the VCR enters the standby mode for timer recording.
This function is possible only when a timer recording has been preset.

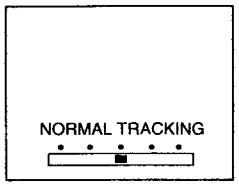
Notes on "GO TO REC START - PLAY"
The memory of the recording start position will be erased and "GO TO REC START - PLAY" will not be operable in the following cases:
- You pressed COUNTER RESET.
- You ejected and inserted the cassette.
- You pressed ◄◄◄HIGH SPEED REWIND.

Playing Back a Tape Recorded on Another VCR

When playing back a tape recorded on another VCR, the tracking condition is automatically adjusted on this VCR. You can also adjust the tracking condition and the sharpness manually according to the following instructions.



Adjust the tracking manually
When the playback picture has streaks or snow during normal playback, adjust the picture manually with TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲.
Press either ▼ or ▲ to obtain the best possible picture. The tracking meter will appear on the TV screen and the AUTO TRACKING indicator will be turned off.
When the manual adjustment proves unsatisfactory, press both of the TRACKING NORMAL SLOW and STILL ADJUST ▼/▲. The tracking condition will return to the center position.



Automatic tracking adjustment function
The tracking condition is automatically adjusted on this VCR. The AUTO TRACKING indicator flashes while the VCR is searching for the best tracking condition and lights when optimum playback picture is obtained. The automatic tracking control is activated in the following conditions:
- — when the cassette is inserted for the first time.
- — when the recording mode on the playback tape is switched from SP to EP and back again.
- — when the picture is distorted by scratches on the tape.
- — when the AUTO TRACKING indicator is turned on by pressing TRACKING AUTO/MANUAL after the picture is adjusted manually.

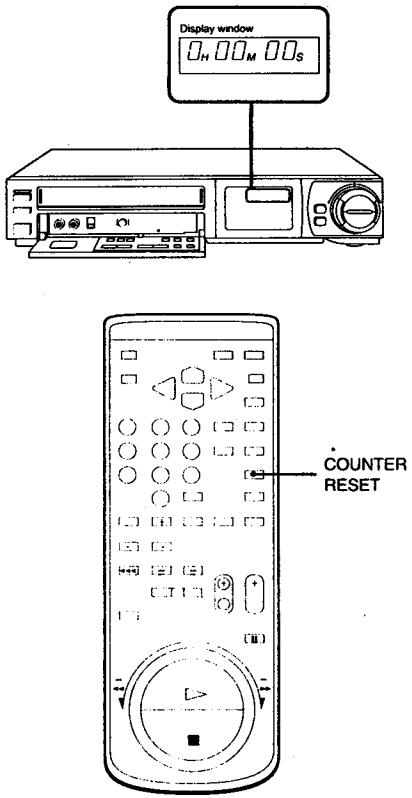
Adjusting the sharpness
Turn the SHARPNESS SOFT/SHARP control toward SHARP to obtain a sharper picture. Turn it toward SOFT to obtain a softer picture.

Notes
- Auto tracking adjustment is not possible for tapes recorded in LP mode.
- Auto tracking adjustment may be impossible and the tracking indicator may not appear on the TV screen when the recording condition of the tape is poor.
- During auto tracking adjustment, streaks or noise may appear.
- The tracking indicator will only appear on the TV screen if DATA SCREEN is in the position.

Using the Tape Counter

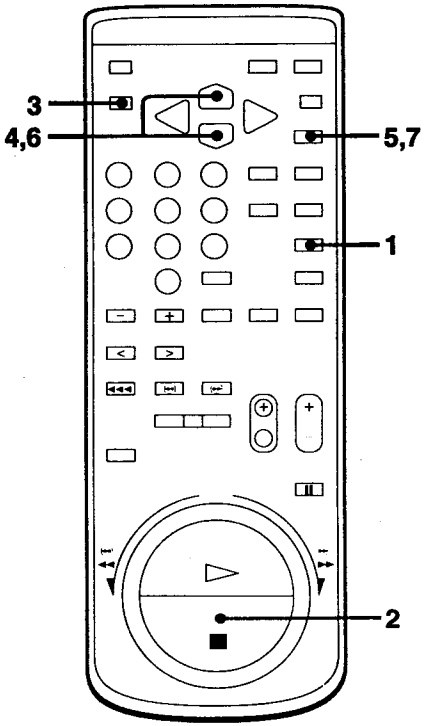
Indexing the Tape Contents

Before starting to record or play back a casette, press COUNTER RESET to reset the counter to zero. By noting the counter reading at the desired point, you can easily find that point later by referring to the counter. Use the label on the cassette to list the programs and their counter readings.



Note on counter reading
After a cassette is ejected, the counter reading is retained, however when a cassette is inserted again, the counter returns to "0H00M00S."

Tape Return/Tape Return Play



Tape return
To stop the tape at a particular point.

1 During playback or recording, press COUNTER RESET at the point you want to locate later.
The tape counter will display "0H00M00S."

2 When recording or playback is completed, press STOP.

3 Press MENU.

MENU
AUTO MENU
▸ TIMER SET/CHECK
TUNER PRESET
CLOCK SET

4 Press ▲ or ▼ to move the cursor to AUTO MENU.

MENU
▸ AUTO MENU
TIMER SET/CHECK
TUNER PRESET
CLOCK SET

5 Press EXECUTE.
AUTO MENU display will appear.

AUTO MENU
▸ PLAY•REW•POWER OFF
GO TO ZERO•STOP
GO TO ZERO•PLAY
GO TO REC START•PLAY
REW•POWER OFF
REW•EJECT•POWER OFF
REW•PLAY
REW•TIMER REC

6 Press ▲ or ▼ to move the cursor to GO TO ZERO - STOP.

AUTO MENU
PLAY•REW•POWER OFF
▸ GO TO ZERO•STOP
GO TO ZERO•PLAY
GO TO REC START•PLAY
REW•POWER OFF
REW•EJECT•POWER OFF
REW•PLAY
REW•TIMER REC

7 Press EXECUTE.
The tape will be rewound or advanced close to the counter zero point and stop.

GO TO ZERO•STOP
S E
◀◀ SP 0:01:09

Tape return play
To start playback automatically from the counter zero point.

1 Follow steps 1 to 5 in "Tape return."

2 Press ▲ or ▼ to move the cursor to GO TO ZERO - PLAY.

AUTO MENU
PLAY•REW•POWER OFF
GO TO ZERO•STOP
▸ GO TO ZERO•PLAY
GO TO REC START•PLAY
REW•POWER OFF
REW•EJECT•POWER OFF
REW•PLAY
REW•TIMER REC

3 Press EXECUTE.

GO TO ZERO•STOP
S E
◀◀ SP 0:01:40

Notes
- The tape counter does not work when the inserted tape has no recordings.
- There may be a difference of several seconds between the COUNTER ZERO position and the position detected by the VCR.

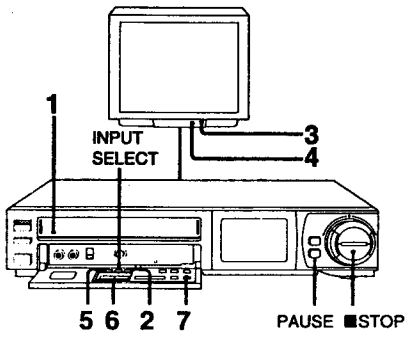
Recording TV Programs

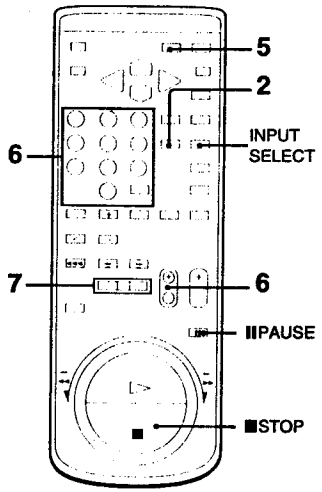
Before you begin, check the following points:

- Check the connections
  Make sure that the connections have been made correctly.
- Check the input mode indicator
  Press INPUT SELECT to light TUNER in the display window.

Caution
Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmission and/or program owner.

Recording TV Programs





1 Put in a cassette.
The VCR turns on automatically (Auto power on).

2 Select the recording tape speed, SP or EP, with TAPE SPEED (SP/EP).

3 Turn on the TV.

4 If your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR.
Select the input for the VCR.
If your TV is connected only to the VHF/UHF OUT on the VCR.
Select the channel for the VCR (CH 3 or CH 4).

5 Press TV/VTR so that the VTR indicator lights in the display window.
Skip this step if your VCR is not connected via the VHF/UHF antenna terminal.

6 Select the channel to be recorded with CHANNEL +/– or channel number buttons and ENTER.

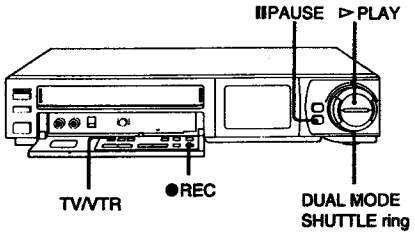
7 Press the two ●REC buttons on the Commander at the same time, or the ●REC button on the unit.

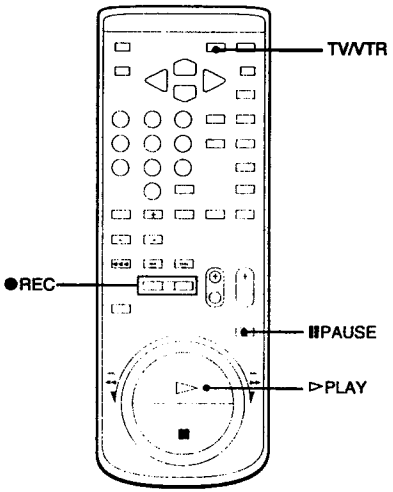
To stop recording
Press ■STOP.

To stop the tape for a moment
Press IIPAUSE. To resume recording, press IIPAUSE.
When the recording pause mode lasts for more than approximately 5 minutes, the unit enters the stop mode.

When the tape reaches its end
The tape rewinds to the beginning. The power will remain on.

Temporarily Stopping Recording at a Particular Point





Technique 1
You can stop recording when an unwanted scene appears and resume recording smoothly.

1 Press II PAUSE when an unwanted scene appears.
Recording will stop and the VCR enters the recording pause mode.

2 Press II PAUSE at the desired point to release the pause mode.
Recording resumes from the point set in step 1.

Technique 2
When an unwanted scene has already started to be recorded, you can return the tape to the desired point, have the VCR standby in the recording pause mode, and resume recording at the desired scene smoothly.

1 Set the VCR to the recording pause mode.

2 Turn the DUAL MODE SHUTTLE ring on the VCR to the left to search for the point from which you wish to continue recording.

3 Release the DUAL MODE SHUTTLE ring at the desired point.
After an instant of STILL mode, the VCR automatically enters the recording pause mode.

4 Press II PAUSE
Recording resumes.

Watching One TV Program while Recording Another

1 Press TV/VTR so that the VTR indicator goes off.

2 Select the channel you want to watch on the TV.

When the VTR indicator lights up

VTR indicator	Picture on the TV screen
Lit	Channel selected by the VCR or the playback picture of the VCR
Unlit	Channel selected by the TV

Recording a Program without Watching the TV

Turn off the power of the TV or color monitor.
There will be no interference with the recording.

Note
If you are using a color monitor, you cannot watch another program while recording unless the monitor has an internal TV tuner.

Timer Recording

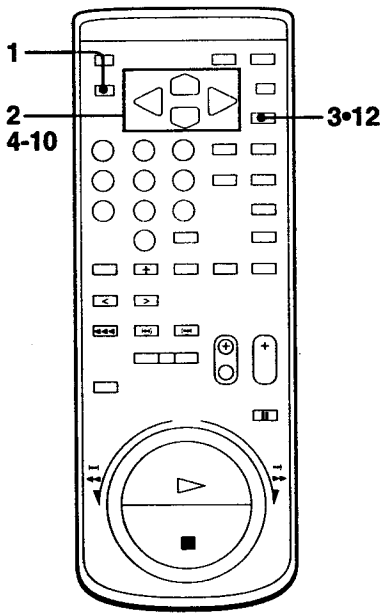
You can preset up to eight recordings up to one month in advance. The recordings can be preset with the Commander while referring to the TIMER SET/CHECK display on the TV screen.

Before you begin, check the following points.
- The date and clock must be set correctly. (See "Setting the Date and Time" on page 12.)
- Make sure that the cassette tape is long enough to record all the programs.
- Make sure that the safety tab on the cassette is not broken off. If you put in a cassette without its safety tab and press TIMER REC (ON/OFF), the cassette automatically ejects.
- Turn on the VCR and the TV.

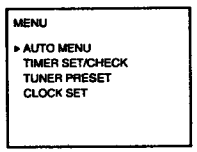
Recording from today to one month later
If today is August 31st, you can set the timer to record a program broadcast between today and September 30 (for 31 days). If today is January 31st, you can set the timer to record a program broadcast between today and February 28th (for 29 days). A leap year is automatically considered.

Setting the Timer

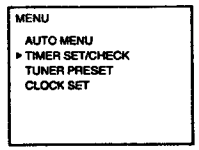
Example: Suppose you want to record a program broadcast on channel 26 from 9:00 pm to 10:55 pm on Friday July 10 in EP mode. Note that 12:00 AM is midnight and 12:00 PM is noon.



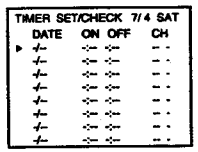
1 Press MENU.
The main menu appears.



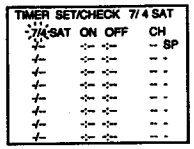
2 Press ▲ or ▼ to move the cursor (▶) to TIMER SET/CHECK.



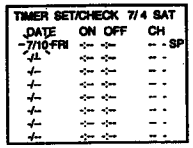
3 Press EXECUTE.
The TIMER SET/CHECK display appears on the screen. When the clock is not set properly, a short beep alerts you. Return to "Setting the Date and Time" (page 12) to reset the clock.



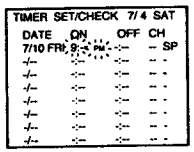
4 Press ▶
Make sure that today's date is flashing. If not, reset the correct time. See "Setting the Date and Time" (page 12).



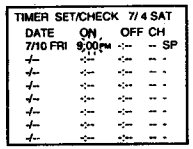
5 Press ▲ to set the month and date to 7/10 FRI.
The day of the week is automatically set.



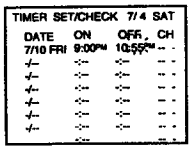
6 Press ▶ to flash the hours section under "ON" then ▲ or ▼ until 9 PM appears.



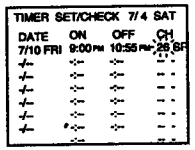
7 Press ▶ to flash the minute section under "ON" then ▲ or ▼ until 00 appears.



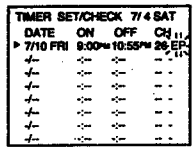
8 Press ▶.
The on-time flashes under "OFF". Set the turn-off time referring to steps 6 and 7.



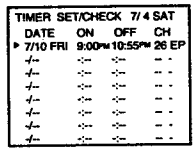
9 Press ▶ to flash the CH position then press ▲ or ▼ until 26 appears.
Only the channels that has been preset in the VCR will appear. The CHANNEL +/- and ENTER or channel number buttons can also be used.



10 Press ▶ to flash the recording speed position then ▲ or ▼ until EP appears. TAPE SPEED can also be used.



11 Press ▶ to store the setting
When all of the settings stop flashing with a ▶ on the left-most position, this indicates that this setting has been completed.



12 Press EXECUTE.
Press TIMER REC (ON/OFF) to enter the timer recording standby mode.

Continued ▶

To change or correct the setting before completing it
Press ◀ to return to the item to be changed.

To preset another program
Move the cursor to the second line after step 11 and repeat steps 4 to 11.

To record video sources from LINE IN 1 or 2 jacks
Press INPUT SELECT in step 4 to 10 to call up LINE 1 or 2 under the "CH" position. The indication returns to channel numbers on the third press.

Problems when TIMER REC (ON/OFF) is pressed

The cassette ejects	The safety tab on the inserted cassette has been removed.
The TIMER indicator does not appear	• No cassette has been inserted. • The tape is at its end.

Daily/Weekly Recording
You can preset the timer-activated recording to the same program every day of the week (Daily recording), or one day of the week (Weekly recording).
Follow steps 1 through 4 in "Setting the Timer" (page 28).

You can select the following programs.

Each time you press▼, the indication under DATE on screen changes in the following order:

SUN—SAT (Every day of the week)
↓
MON—SAT (Every day except Sunday)
↓
MON—FRI (Every day except Saturday and Sunday)
↓
EVERY SAT
:
:
EVERY TUE
↓
EVERY MON
↓
EVERY SUN

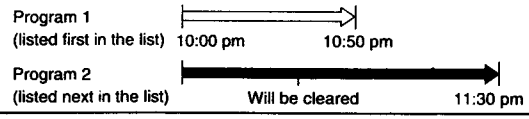
When your desired daily/weekly recording program is set and transmitted to the VCR, the corresponding indicator lights in the display window.

If a power interruption occurs
- If a power interruption lasting less than approximately one hour occurs while the VCR is waiting for the preset time, the VCR will re-enter the timer recording standby mode.
- If a power interruption lasting more than approximately one hour occurs before a timer recording, the memory clears. Reset the date and time for timer recording.
- If a power interruption lasting less than approximately one hour occurs during a timer recording, the VCR starts recording again and the tape counter indicates "0H00M00S."

When Preset Timer Recordings Overlap

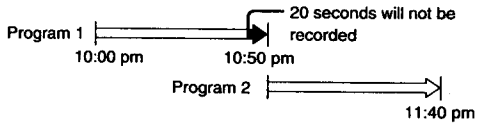
Case 1
If the turn-on time of two programs are the same

The program listed first on the TIMER SET/CHECK display has priority over the other programs. The timer recording parameters of lower priority programs will be erased from the TIMER SET/CHECK display when recording starts.



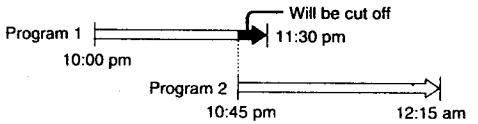
Case 2
If the recording start time of program 2 is the same as the recording end time of program 1

The last 20 seconds of program 1 will not be recorded.



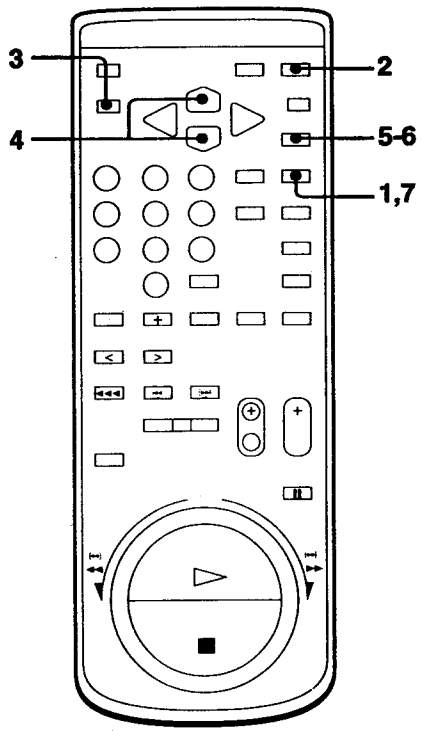
Case 3
If the recording start time of program 2 comes before recording of program 1 is over

The recording of program 2 will begin before program 1 is finished.



Checking the Timer Settings

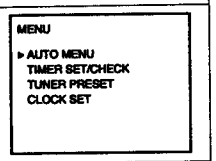
You can display all of the timer settings on the TV screen to check the settings.



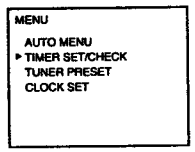
1 **Press TIMER REC (ON/OFF) to turn off the TIMER indicator in the display window.**

2 **Press POWER.**

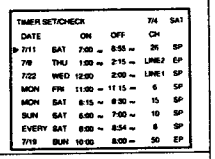
3 **Press MENU.**
The main menu appears.



4 **Press ▲ or ▼ to move the cursor to TIMER SET/CHECK.**



5 **Press EXECUTE.**
The TIMER SET/CHECK display appears.


TIMER SET/CHECK
DATE ON OFF CH
▸7/11 SAT 7:00 ~ 8:55 ~ 26 SP
7/9 THU 1:00 ~ 2:15 ~ LINE2 EP
7/22 WED 12:00 2:00 ~ LINE1 SP
MON FRI 11:00 ~ 11:15 ~ 6 SP
MON SAT 8:15 ~ 8:30 ~ 15 SP
SUN SAT 6:00 ~ 7:00 ~ 10 SP
EVERY SAT 8:00 ~ 8:54 ~ 6 SP
7/19 SUN 10:00 8:00 ~ 50 EP

6 **Press EXECUTE to return to original screen.**

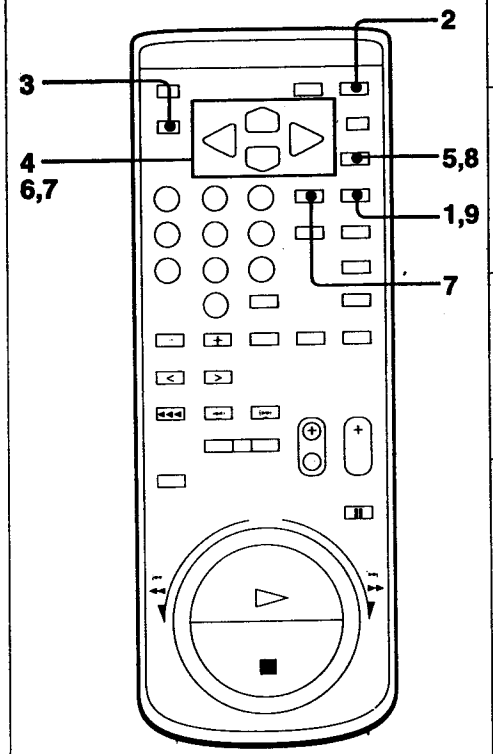
7 **Press TIMER REC (ON/OFF) to return to the timer recording standby mode.**

The TIMER SET/CHECK display
When a recording is set for only one day, that setting is erased from the TIMER SET/CHECK display after the recording is over.

To check the timer setting during timer recording
Follow steps 3 to 6 above.

Changing or Cancelling the Timer Settings

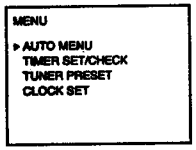
The timer settings can be changed or canceled by referring to the TIMER SET/CHECK display.



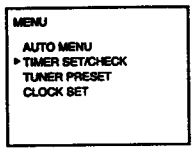
1 **Press TIMER REC (ON/OFF) to turn off the TIMER indicator in the display window.**

2 **Press POWER.**

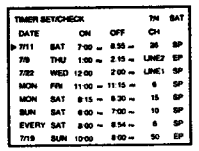
3 **Press MENU.**
The main menu appears.



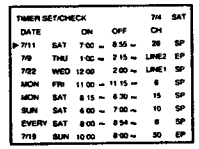
4 **Move the cursor to TIMER SET/CHECK.**



5 **Press EXECUTE.**
TIMER SET/CHECK display appears.


TIMER SET/CHECK
DATE ON OFF CH
▸7/11 SAT 7:00 ~ 8:55 ~ 26 SP
7/9 THU 1:00 ~ 2:15 ~ LINE2 EP
7/22 WED 12:00 2:00 ~ LINE1 SP
MON FRI 11:00 ~ 11:15 ~ 6 SP
MON SAT 8:15 ~ 8:30 ~ 15 SP
SUN SAT 6:00 ~ 7:00 ~ 10 SP
EVERY SAT 8:00 ~ 8:54 ~ 6 SP
7/19 SUN 10:00 8:00 ~ 50 EP

6 **Press ▲or▼ to move the cursor to the program you wish to change or cancel.**


TIMER SET/CHECK
DATE ON OFF CH
▸7/11 SAT 7:00 ~ 8:55 ~ 26 SP
7/9 THU 1:00 ~ 2:15 ~ LINE2 EP
7/22 WED 12:00 2:00 ~ LINE1 SP
MON FRI 11:00 ~ 11:15 ~ 6 SP
MON SAT 8:15 ~ 8:30 ~ 15 SP
SUN SAT 6:00 ~ 7:00 ~ 10 SP
EVERY SAT 8:00 ~ 8:54 ~ 6 SP
7/19 SUN 10:00 8:00 ~ 50 EP

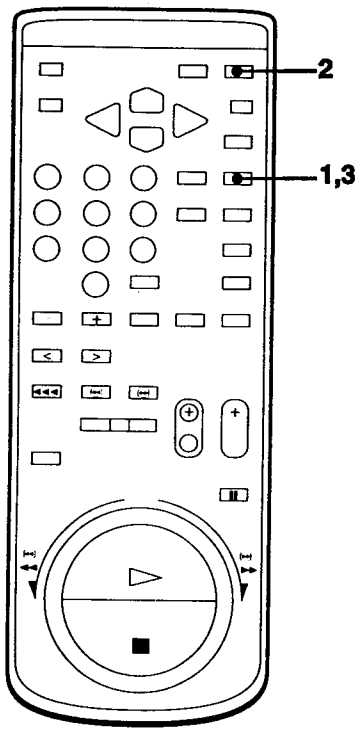
7 **To change it, flash the item to be changed by pressing ◀ or ▶ and make the required changes by pressing ▲ or ▼.**
To cancel it, press TIMER REC CLEAR.

8 **Press EXECUTE to store the changes and to return to the original screen.**

9 **Press TIMER REC (ON/OFF) to return to the timer recording standby mode.**

Using the VCR before Timer Recording Starts

If you want to use the VCR when it is in the timer recording standby mode, you must first turn off the TIMER indication in the display window and to exit the timer recording standby mode.



1 Press TIMER REC (ON/OFF) so that the TIMER indicator in the display window goes off.

2 Press POWER.
Now the VCR is ready to be used.

3 After using the VCR, press TIMER REC (ON/OFF) to return to the timer recording standby mode and to light the TIMER indicator.

After Entering Timer Recording Standby Mode

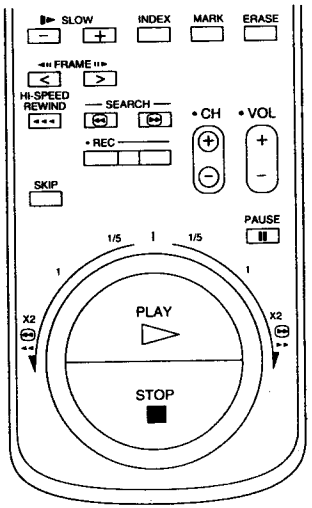
Automatic power on
The VCR goes on automatically when the set time comes on and starts recording. When it completes recording, the power automatically goes off.

To stop recording activated by the timer
Press TIMER REC (ON/OFF).

Buttons which can be operated during timer recording
- TIMER REC (ON/OFF)
- COUNTER RESET (See "Indexing the Tape Contents" page 24.)
- TV/VTR (See "Watching One TV Program While Recording Another" page 27.)
- DATA SCREEN (See "About the Data Screen" page 20.)
- MENU (For checking the programs only. See "Checking the Timer Settings" page 32.)

Variable Speed Playback – DUAL MODE SHUTTLE RING

You can enjoy playing back pictures in variable speeds on the VCR. Using the DUAL MODE SHUTTLE ring, you can obtain variable speed playback easily by turning the ring to the desired playback-position and holding it at that position.



Still Picture

During playback mode, press ⏸ PAUSE. To resume normal playback, press ▷ PLAY or ⏸ PAUSE. When pause mode lasts for more than 5 minutes, the VCR re-enters playback mode automatically.

Picture Search

During playback or still mode, turn the DUAL MODE SHUTTLE ring clockwise (forward direction) or counter-clockwise (reverse direction) until the double arrows ▶▶ or ◀◀ appears on the TV screen. Hold the ring at that position. While holding it, a high speed picture without sound appears on the TV screen.
If you release the ring, normal playback resumes.

Note
The picture may turn to black and white during picture search depending on the TV connected to the VCR when you play back tapes recorded in LP recording tape speed.

Locked Picture Search

During playback or playback pause mode, press ⏪ SEARCH or ⏩ SEARCH on the Commander. A high speed picture in forward or reverse appears on the screen even when the button is released. To resume normal playback, press ▷PLAY.

Skip Playback

The skip function allows you to scan ahead 30 seconds at high speed during the playback mode. Press SKIP on the Commander.
A high speed picture of the scene appears on the screen for about 30 seconds for each press and then normal playback resumes.

Slow Motion Playback

During playback or playback pause mode, press ▮► SLOW + or – on the Commander. Change the slow motion speed with the + or – buttons. Press + to increase the playback speed, and – to decrease the playback speed.

Viewing a Picture Momentarily during Fast-forward or Rewind

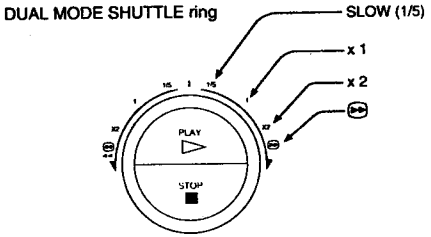
During fast-forward or rewind, turn the DUAL MODE SHUTTLE ring on the VCR clockwise (forward) or counter-clockwise (reverse direction).
You can view a picture at high speed while you hold the ring at that position.
If you release the ring, the VCR returns to the previous status (fast-forward or rewind).

Frame-by-Frame Picture

During playback pause mode, press ◀II FRAME II▶ > to advance the picture one frame or ◀II FRAME II▶ < to reverse the picture one frame. Each time you press the button, the picture moves one frame. To resume normal playback, press ▷PLAY.

Variable Speed Playback

Various playback modes as illustrated below can be selected with DUAL MODE SHUTTLE ring during playback mode or playback pause mode. The same speeds are available in the reverse direction. If you release the ring, the VCR returns to the previous mode (playback mode or playback pause mode).
To resume normal playback, press ▷PLAY.



Adjusting the Picture Manually in Variable Speed Playback

If streaks or noise appear on a slow motion picture
Adjust the picture with the TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ buttons inside the front panel.
The picture can be adjusted more easily by changing the speed closer to normal playback by pressing ▮►SLOW +.

If the picture appears to shake in the still mode
Adjust the picture with the STILL ADJUST ▼ / ▲ buttons inside the front panel until the picture stabilizes.

If a band appears on the top or bottom of the screen in still mode
Adjust the picture with the TRACKING NORMAL/SLOW and STILL ADJUST ▼ / ▲ buttons inside the front panel while playing back the tape in a slow motion.

Note
Streaks or noise cannot be completely eliminated in the reverse direction playback or in reverse slow modes.

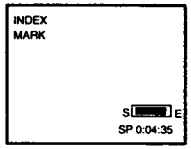
Index Function

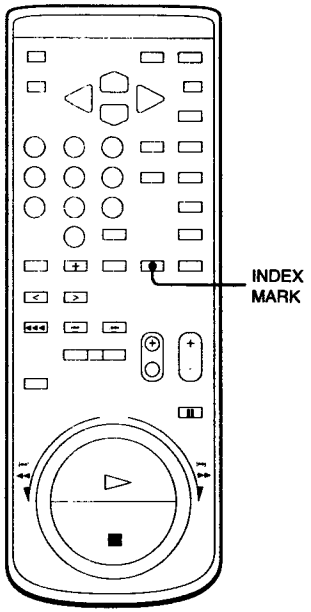
You can use the Index feature of your VCR to index tapes on which you've recorded programs so that you can later quickly locate these specific programs on the tape.

Marking Index Signals

Display window

TV screen





The INDEX indicator flashing in the display window and the INDEX MARK display on the TV screen show that an index signal has been marked.

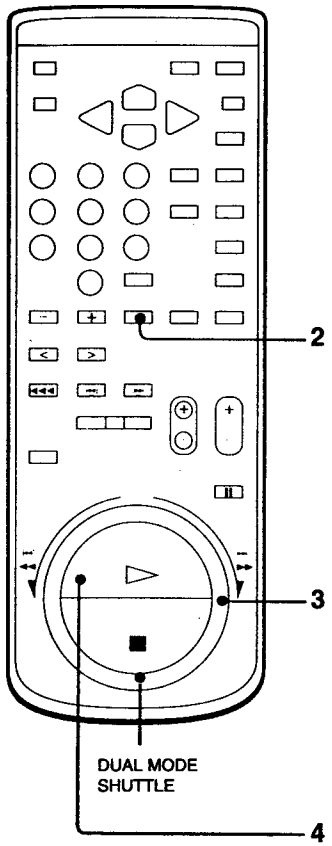
Automatic index mark
An index signal is automatically marked at the beginning of recording.

Manual index mark
Index signals can be marked at any desired point during any recording or normal playback. Press INDEX MARK to mark an index signal.

Notes
- Leave an interval of more than 2 minutes between index signals when marking them one after the other so that the VCR can detect them correctly.
- While an index signal is being marked during playback, the recorded sound will not be heard, but it will not be erased.
- You cannot mark an index signal in the following cases:
  — On a tape without its safety tab.
  — On an unrecorded portion of a tape.
  — Immediately before a point on the tape where the tape speed (EP or SP) changes.
  — When playing back a tape recorded in LP mode.

Playing Back from the Index Point—Index Scan

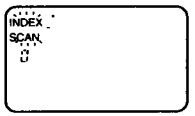
The beginning of each program can be found and played back by using the index signals.



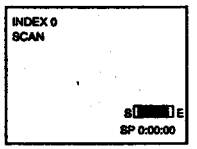
1 Put in a cassette with index signals.

2 Press INDEX once.
The INDEX and SCAN indicator flashes alternately.

Display window

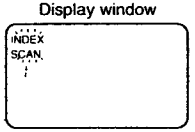


TV screen

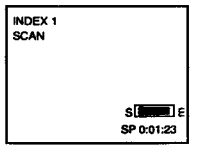


3 Turn the DUAL MODE SHUTTLE ring clockwise to locate the program ahead or counter-clockwise to locate the previous program.
The INDEX SCAN indicatpr flashes continuously while scanning. The tape rewinds or rapidly advanced to the next marked index signal. The tape plays back for approximately 10 seconds from the index signal, and then rewinds or advances to the next index signal. Every time an index signal is detected and playback begins, the displayed index number increases.

Display window

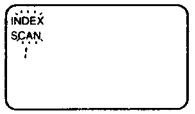


TV screen

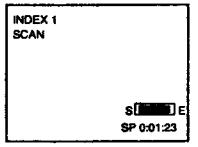


4 When the desired program is detected, press ▷PLAY.
Playback starts from that point.

Display window

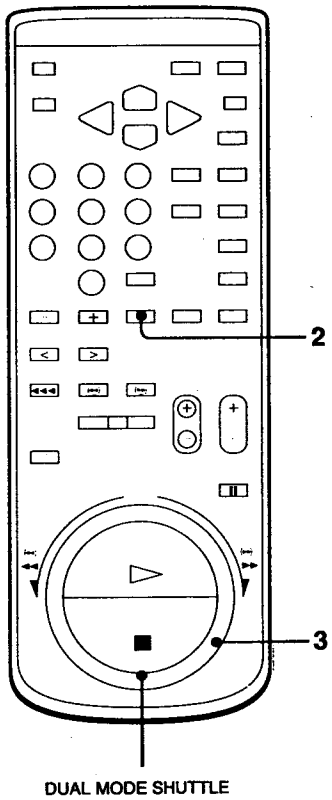


TV screen



Locating an Index — Index Search

A particular program can be located and played back by designating how many index signals ahead or behind that program is from the current position. Up to 19 indexes can be searched for.

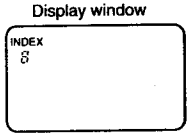


1 Put in a cassette with index signals.

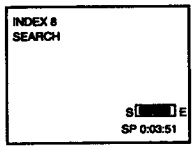
2 Press INDEX until the index number of the desired program is displayed.

The INDEX indicator and the INDEX number are displayed.

Display window



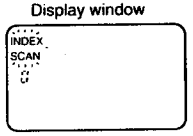
TV screen



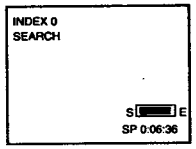
3 Turn the DUAL MODE SHUTTLE ring counter clockwise if the index is behind, or clockwise if the index is ahead of the current tape position.

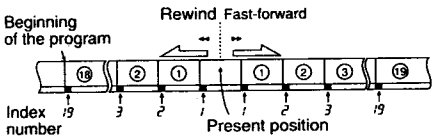
The tape rewinds or rapidly advances. Every time an index signal is detected, the INDEX number decreases. When the number reaches 0, playback of your desired program begins.

Display window



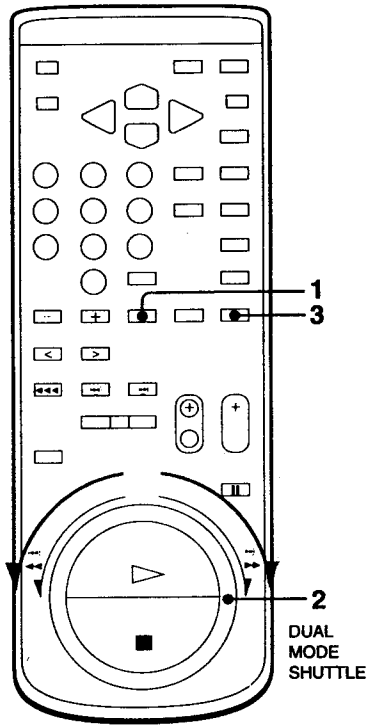
TV screen





Erasing Index Signals

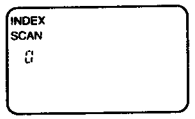
Unnecessary index signals can be erased.



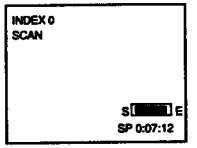
1 Press INDEX once.

The INDEX and SCAN indicator blinks alternately.

Display window



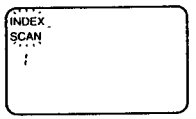
TV screen



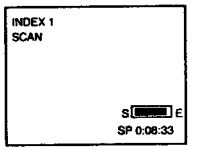
2 Turn the DUAL MODE SHUTTLE ring clockwise or counterclockwise to search for the index signal to be erased.

The tape rewinds or rapidly advances.
Every time an index signal is detected, the tape plays back and then rewinds or advances to the next index signal.

Display window



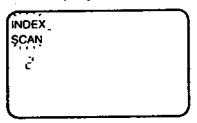
TV screen



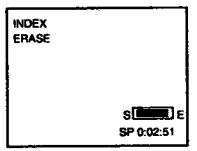
3 When you reach the index signal you wish to erase, press INDEX ERASE within approximately 10 seconds after you have verified the playback picture.

The INDEX indicator flashes.
While the index signal is being erased, the recorded sound is not heard, but it is not erased from the tape.

Display window



TV screen



Notes

- Index signals marked on a portion of tape just before or after the recording modes, SP and EP, are switched cannot be erased.
- Index signals marked on an LP mode tape cannot be erased.

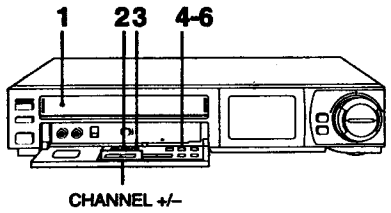
Quick Timer Recording

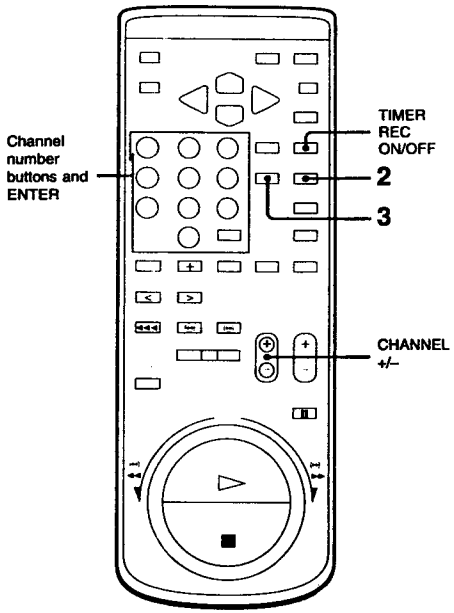
This function is convenient when, for example, you want to set the VCR to start recording immediately without going through the whole timer setting procedure.
However, the quick timer recording function only provides a very rough setting for the desired program.

Before you begin, check the following points.

- Press TIMER REC (ON/OFF) if the TIMER indicator is turned on.
- If you are currently recording, perform step 6 only.

Quick Timer Recording





1 Put in a cassette.

2 Press INPUT SELECT so that the TUNER indicator is turned on.

3 Press TAPE SPEED (SP/EP) to decide the tape speed, SP or EP.

4 Press QUICK TIMER on the VCR.
Select the channel for recording with CHANNEL +/– or channel number buttons and ENTER while the channel display is flashing.

5 Press QUICK TIMER again to start recording.

6 To decide the recording duration, press QUICK TIMER to change the duration indicator.
Every press of QUICK TIMER increases the recording duration in units of 30 minutes.

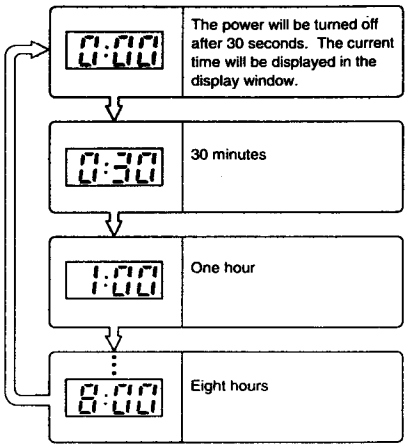
You can leave your VCR after turning off the TV. The VCR automatically goes off when the recording is finished.

If a cassette without its safety tab is inserted
The cassette is ejected automatically when you press QUICK TIMER.

To stop quick timer recording
Press TIMER REC ON/OFF.

Recording Duration Indicator

Every time you press QUICK TIMER, the recording duration indicator will change as shown in the illustration. The recording duration can be changed by pressing QUICK TIMER even during quick timer recording. The duration indicator counts down the recording time, minute by minute, during recording.



Buttons Operable during Quick Timer Recording

TIMER REC (ON/OFF)	To stop quick timer recording.
QUICK TIMER	To change recording duration.
COUNTER RESET	To reset the tape counter to zero.
INDEX MARK	To record an index signal.
TV/VTR	To watch the picture broadcast on another channel. (TV)
MENU	Only operable to check the timer recording settings. (See "Checking the Timer Settings" on page 32.)

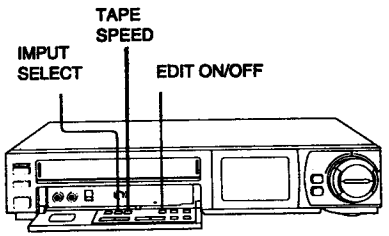
If the tape runs out during quick timer recording
Recording will stop and the power goes off. The tape will not rewind automatically.

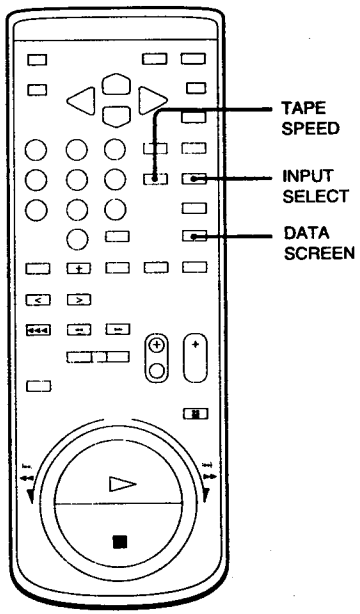
If a power interruption occurs during quick timer recording
Recording will stop and the power goes off. If the power interruption lasts less than 1 hour and the power is restored before the recording end time, recording will start again from that point.

Editing

By connecting an additional VCR, you can create original video program tapes.

Preliminary Setting for Editing





When using this VCR as the recording VCR
Before editing, check these settings:

- **INPUT SELECT** : Select LINE 1 or LINE 2, whichever the playback VCR is connected to.
- **TAPE SPEED** : Select SP or EP.
- **Edit indicator** : Press EDIT ON/OFF to light the EDIT indicator.

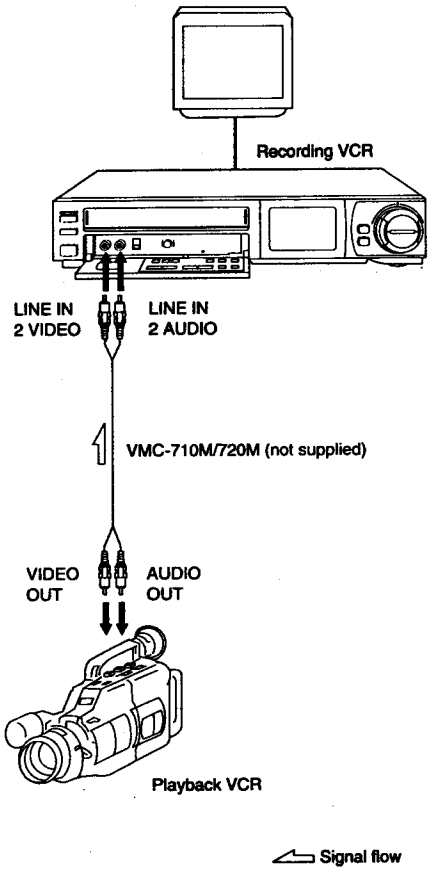
When using this VCR as the playback VCR
Before editing, check these settings:

- **EDIT indicator** : Press EDIT ON/OFF to light the EDIT indicator.
- **DATA SCREEN** : Press to erase the on-screen displays.

Use of the EDIT ON/OFF button
Even when using the EDIT mode during editing, the quality of the edited tape will have a certain amount of deterioration in picture. Avoid using an edited tape for multiple generations of editing.

Editing from Another VCR

Using this VCR as the Recording VCR and an 8 mm Video Camera Recorder as the Playback VCR



Signal flow

1 **Put a cassette for recording into the recording VCR.**

2 **Turn on the power of the playback VCR and insert a source cassette.**

3 **Activate the EDIT mode on the recording VCR.**
Activate the EDIT mode on the playback VCR if the player has this function.

4 **Search for the playback start point and enter the playback pause mode.**

5 **Search for the recording start point and enter the recording pause mode.**

6 **Press the PAUSE button on both of the units.**
Recording of the signals from the playback VCR will start.

When editing is completed
Press the STOP button on both of the VCRs.

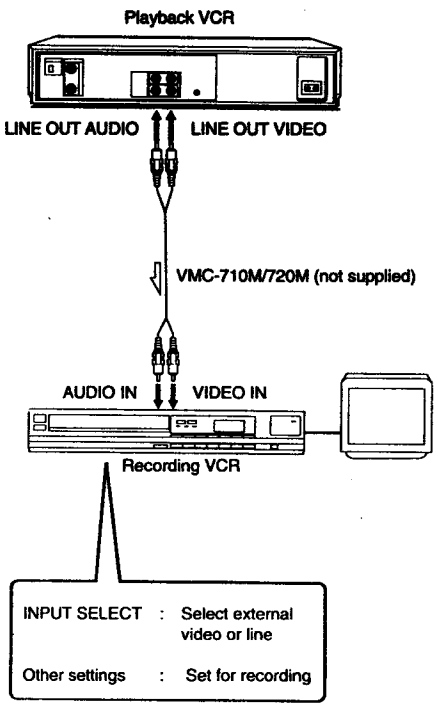
When pressing PAUSE
Press the PAUSE button on the playback VCR a little before pressing the one on the recording VCR.

When the playback VCR is a stereo unit
Make connections with the VMC-910MS/920MS cable (not supplied).

When connecting the VCRs
Do not connect both LINE IN and LINE OUT jacks on the two VCRs simultaneously. Doing so may cause a humming noise.

Editing onto Another VCR

Using this VCR as the Playback VCR and a Betamax VCR as the Recording VCR



1 **Turn on the power of the recording VCR and insert a cassette for recording.**

2 **Put in a source cassette into the playback VCR.**

3 **Activate the EDIT mode on the playback VCR.**
Activate the EDIT mode on the recording VCR if the recorder has this function.

4 **Search for the playback start point and enter the playback pause mode.**

5 **Search for the recording start point and enter the recording pause mode.**

6 **Press the PAUSE button on both of the units.**
Recording of the signals from the playback VCR will start.

When editing is completed
Press the STOP button on both of the units.

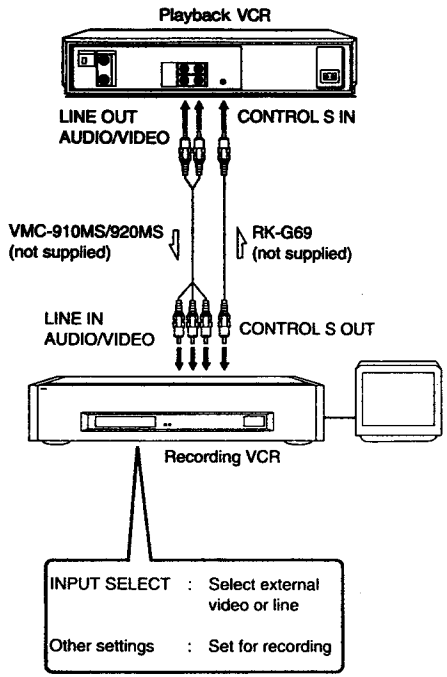
When pressing PAUSE
Press the PAUSE button on the playback VCR just before pressing the one on the recording VCR.

When the recording VCR is a stereo unit
Make connections with the VMC-910MS/920MS cable (not supplied).

When connecting the VCRs
Do not connect both LINE IN and LINE OUT jacks on the two VCRs simultaneously. Doing so may cause a humming noise.

Synchronized Editing onto Another VCR

Using this VCR as the Playback VCR and Another VCR with a CONTROL S OUT Terminal and the Synchro Edit Function as the Recording VCR



This section shows you how to use the synchronizing function of another VCR with SYNCHRO EDIT on this VCR while editing your tape. For synchronized editing, you can use this VCR as the playback VCR and another VCR with a CONTROL S OUT terminal and the synchro edit function as the recording VCR.

1 **Turn on the power of the recording VCR and insert a tape for recording.**

2 **Put in a source tape into the playback VCR.**

3 **Activate the EDIT mode on the playback VCR.**
Activate the EDIT mode on the recording VCR if the recorder has this function.

4 **Search for the edit start point and enter the recording pause mode.**

5 **Search for the playback start point and enter the playback pause mode.**

6 **Press SYNCHRO EDIT on the recording VCR.**
Both recording and playback will start.

7 **At the desired edit end point, press SYNCHRO EDIT on the recording VCR.**
The recording VCR enters the recording pause mode and the playback VCR enters the playback pause mode.

To edit the next scene
Repeat steps 5, 6 and 7.

When editing is completed
Press STOP on both of the units.

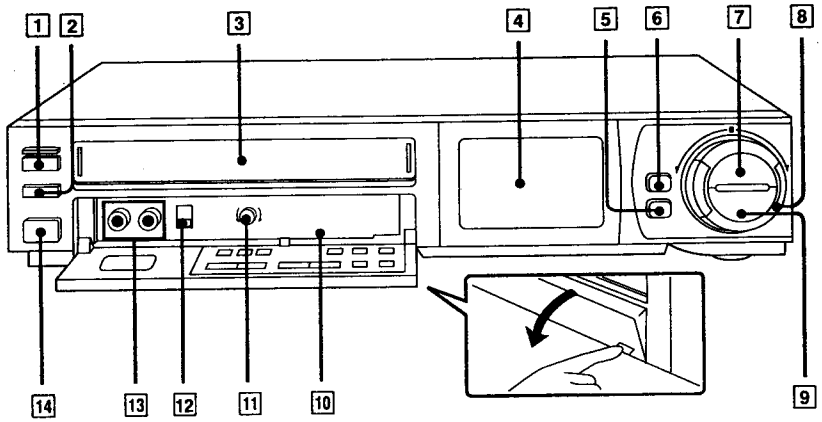
When the recording VCR is a monaural unit
Make connections with the VMC-710M/720M cable (not supplied).

When connecting the VCRs
Do not connect both LINE IN and LINE OUT jacks on the two VCRs simultaneously. Doing so may cause a humming noise.

Identifying the Parts and Controls

Refer to the pages indicated for details.

Front Panel



1 POWER ON/OFF switch and indicator (page 8)

2 ⏏EJECT button (page 18)

3 Cassette compartment

4 Display window and function mode display (page 51)

5 PAUSE button (page 36)

6 ◀◀◀HIGH SPEED REWIND button (page 20)

7 ▷PLAY button (page 19)

8 DUAL MODE SHUTTLE ring

9 ■STOP button (page 20)

10 CL (clear) button (page 55)

11 SHARPNESS SOFT/SHARP control (page 22)

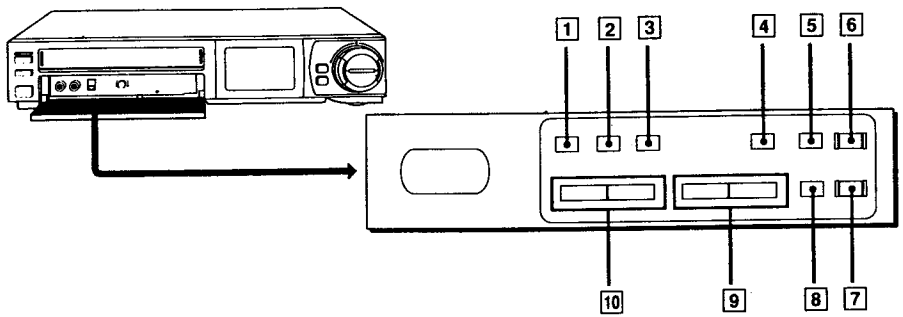
12 COMMAND MODE VTR 1/VTR 2/VTR 3 selector (page 10)

13 LINE IN 2 VIDEO and AUDIO jacks (phono type) (page 45)

14 Remote sensor

Refer to the pages indicated for details.

Inside of the Front Panel



1 TV/VTR button (page 8)

2 INPUT SELECT button (page 26)

3 TAPE SPEED (SP/EP) button (page 26)

4 EDIT ON/OFF button (page 44)

5 QUICK TIMER button (page 42)

6 TIMER REC ON/OFF button (page 29)

7 REC button (page 26)

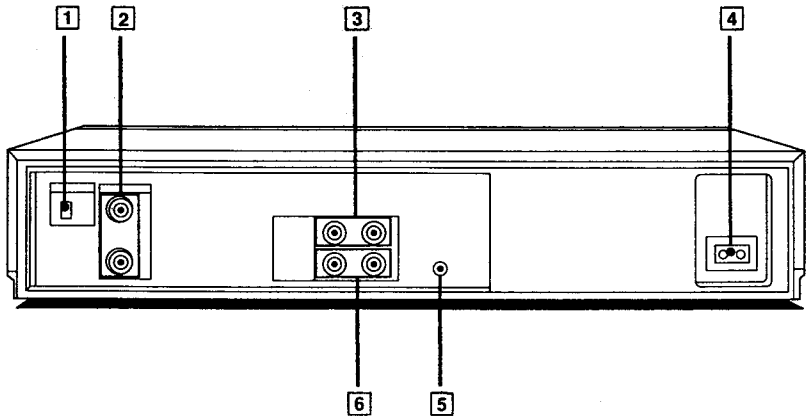
8 TRACKING AUTO/MANUAL button (page 23)

9 TRACKING NORMAL/SLOW and STILL ADJUST ▼/▲ buttons (page 23)

10 CHANNEL +/– buttons (page 26)

Refer to the pages indicated for details.

Rear Panel



1 RF UNIT selector (page 8)

2 VHF/UHF IN/OUT connectors (F-type) (page 6)

3 LINE IN 1 VIDEO and AUDIO jacks (phono type)

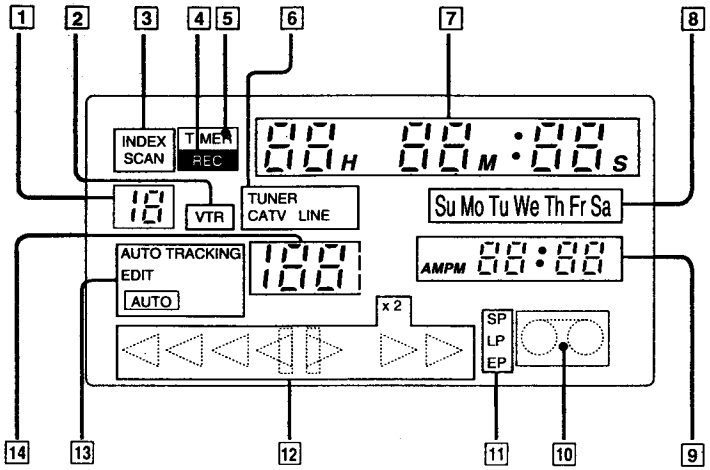
4 AC IN socket

5 CONTROL S IN jack (mini type) (page 47)

6 LINE OUT VIDEO and AUDIO jacks (phono type) (page 6)

Refer to the pages indicated for details.

Indications in the Display Window



1 Index number indicator (page 38)

2 VTR indicator (page 27)

3 INDEX, INDEX SCAN indicator (page 38)

4 REC (recording) indicator

5 TIMER recording indicator

6 Input mode indicator

7 Linear time counter (page 24)

8 Day of the week indicator (page 30)

9 Quick timer recording time/current time (page 42)

10 Cassette indicator

11 Tape speed indicator (LP is for playback only.)

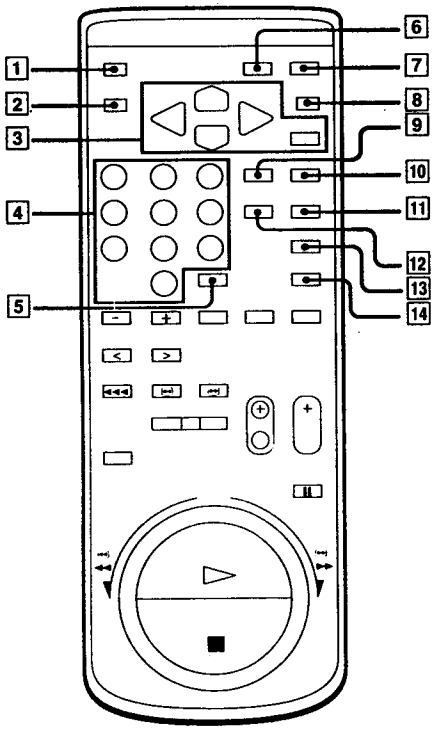
12 Tape operation indicator

13 Various function indicators AUTO TRACKING (Automatic tracking), EDIT, AUTO (Automatic tape operation)

14 Channel number/input mode indicator

Refer to the pages indicated for details.

Remote Commander



1 TV/VTR remote control selector (page 10)

2 MENU button

3 EXECUTE button and cursor shift ▲ / ▼ / ◀ / ▶ buttons

4 Channel number buttons (page 26)

5 ENTER button

6 TV/VTR button (page 27)

7 POWER switch (page 8)

8 COMMAND MODE 1/2/3 selector (page 10)

9 TIMER REC CLEAR button (page 33)

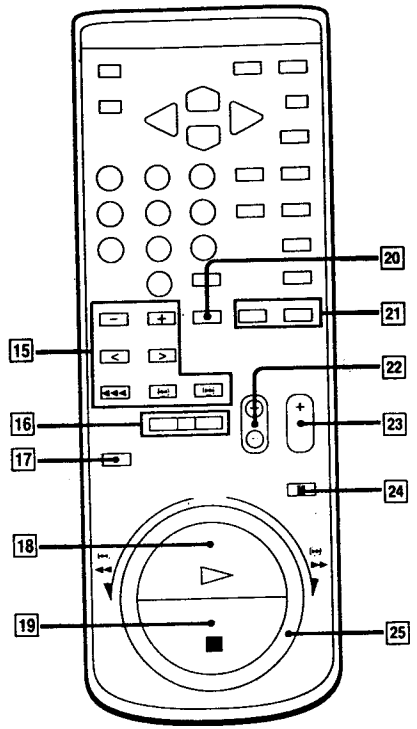
10 TIMER REC ON/OFF button (page 29)

11 INPUT SELECT button (page 26)

12 TAPE SPEED button (page 26)

13 COUNTER RESET button (page 24)

14 DATA SCREEN button (page 20)



15 Tape transport buttons (pages 20, 36, 37)
▮►SLOW (+ : to increase the speed, – : to reduce the speed)
◀▮ FRAME ▮► (frame-by-frame picture and tape direction for slow motion playback; >: forward/<: reverse)
HI-SPEED REWIND ◀◀◀
SEARCH (reverse/forward) ⏮⏭

16 ●REC buttons (Press the two buttons simultaneously) (page 26)

17 SKIP button (page 36)

18 PLAY button (page 19)

19 STOP button (page 20)

20 INDEX button (page 39)

21 INDEX MARK/ERASE buttons (page 38)

22 CHANNEL +/– buttons (page 26)

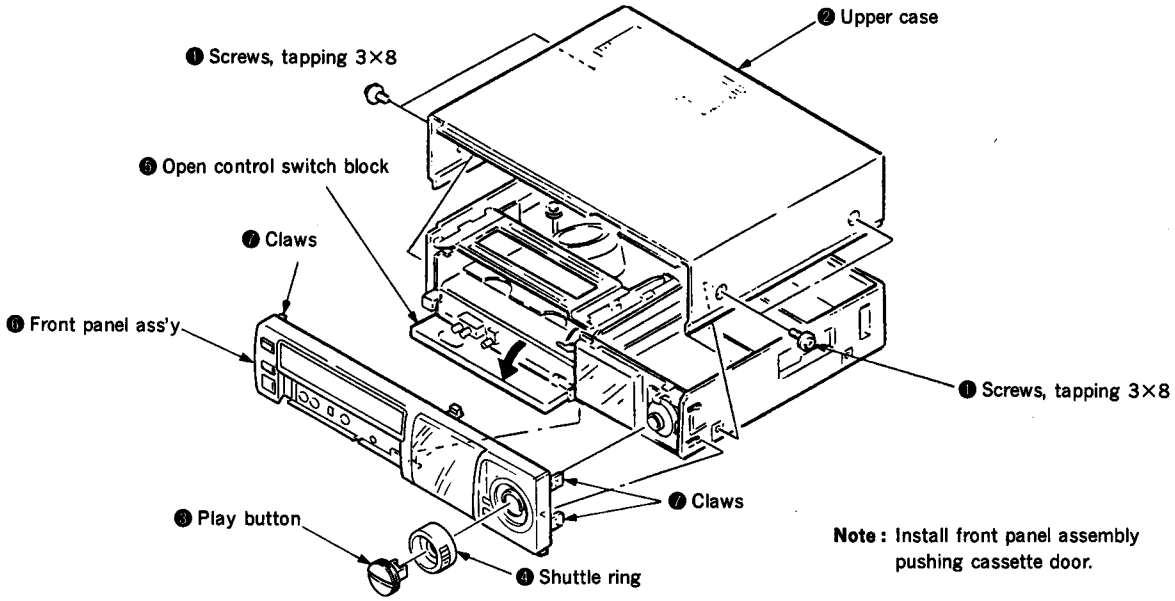
23 VOL +/– buttons

24 PAUSE button (page 36)

25 DUAL MODE SHUTTLE ring (pages 20, 36-37)

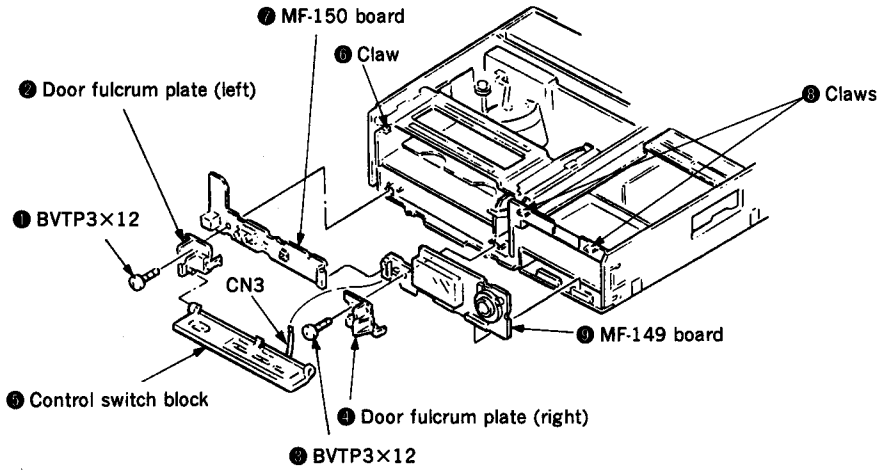
SECTION 2
DISASSEMBLY

2-1. UPPER CASE, FRONT PANEL ASSEMBLY

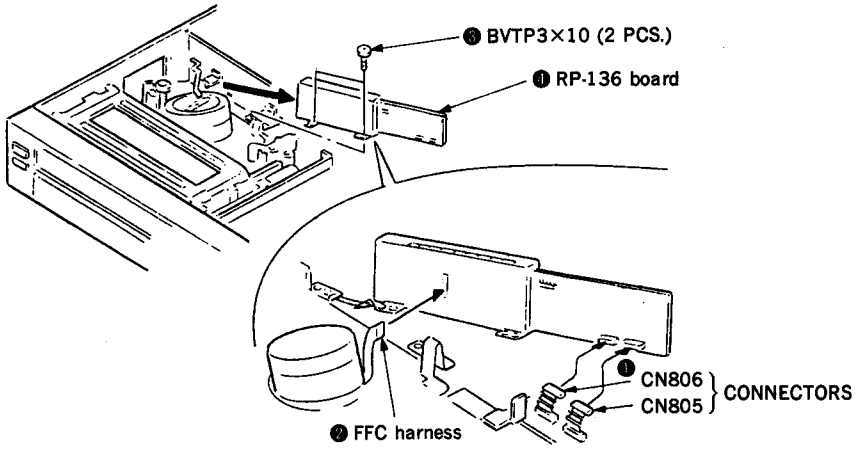


Note : Install front panel assembly pushing cassette door.

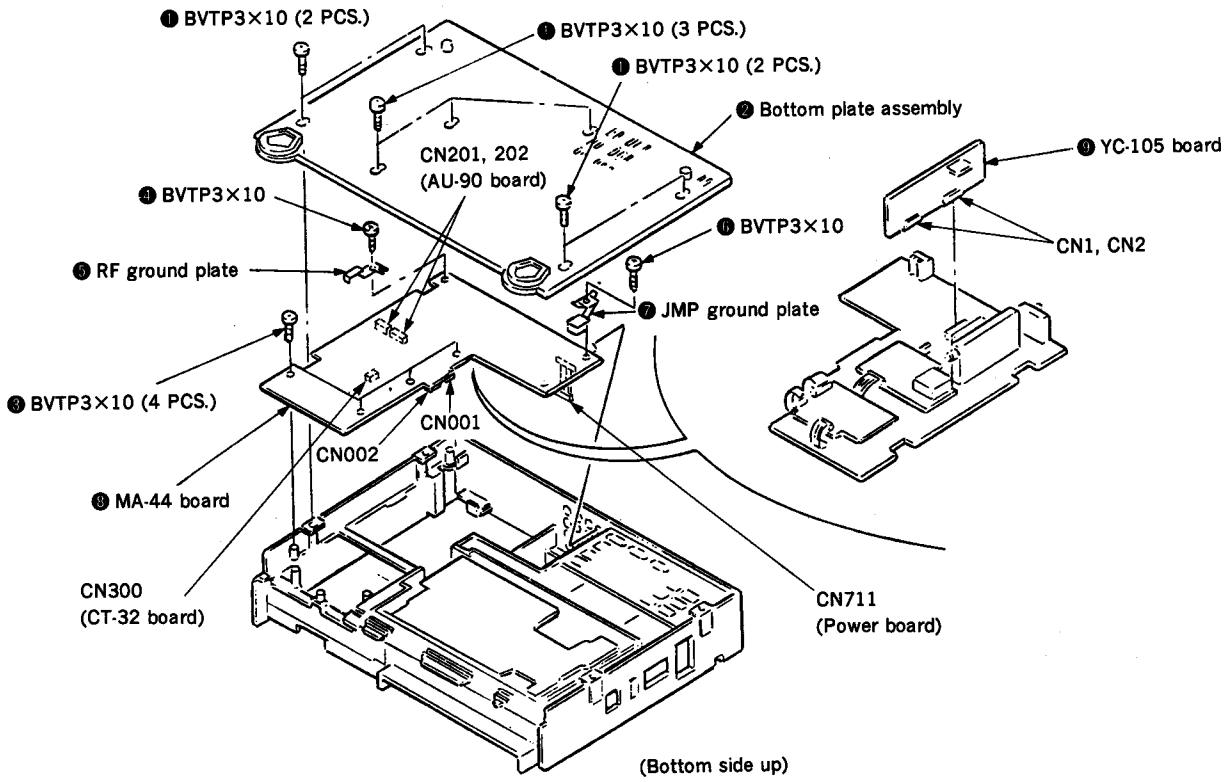
2-2. MF-149 BOARD, MF-150 BOARD, CONTROL SWITCH BLOCK AND SHUTTLE DIAL ASSEMBLY



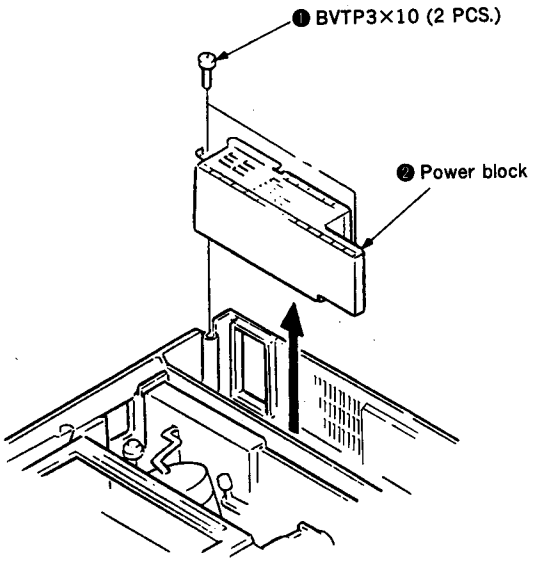
2-3. RP-136 BOARD



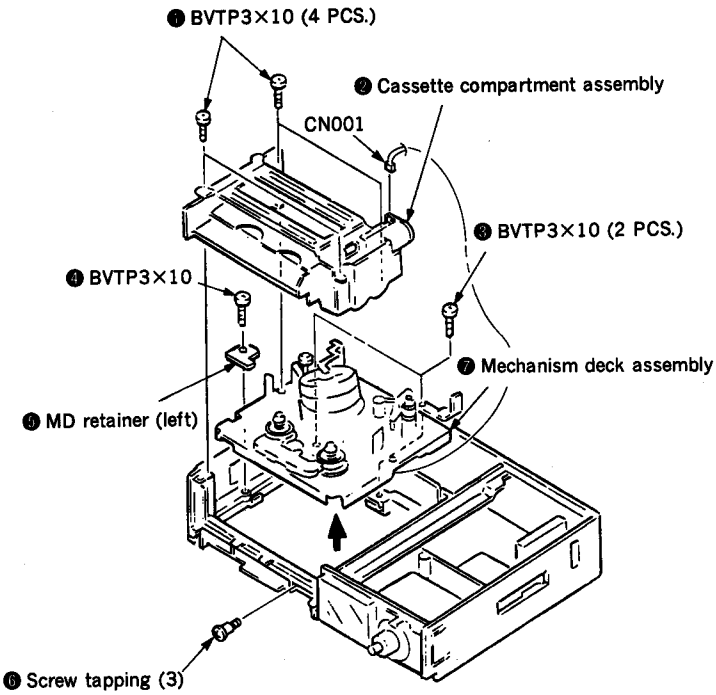
2-4. BOTTOM PLATE, MA-44 BOARD AND YC-105 BOARD



2-5. POWER BLOCK

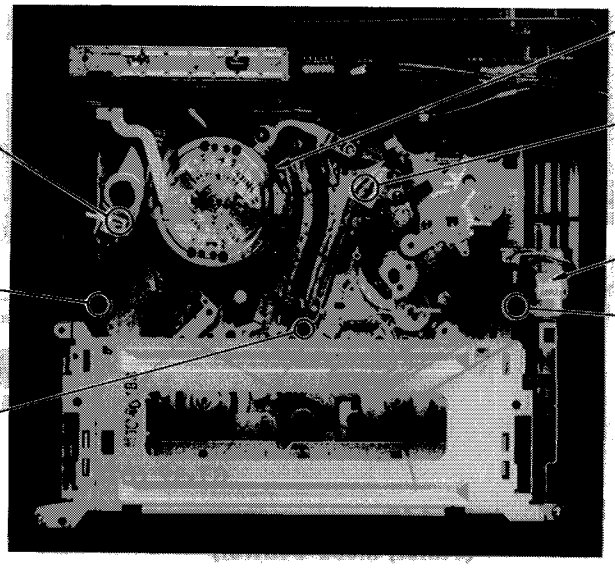


2-6. CASSETTE COMPARTMENT ASSEMBLY AND MECHANISM DECK ASSEMBLY

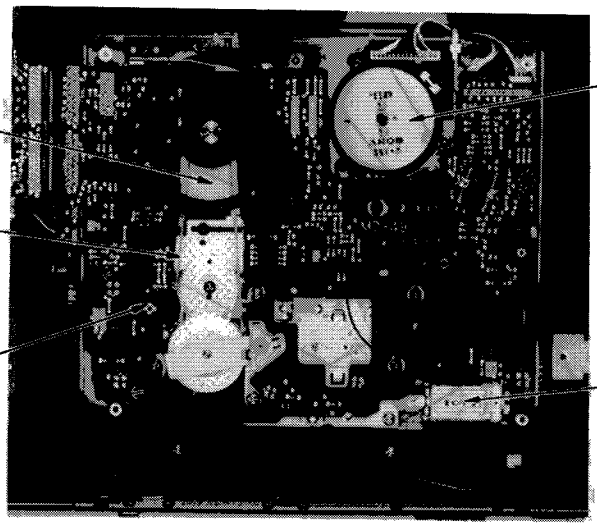


2-7. INTERNAL VIEWS

— Top Side —

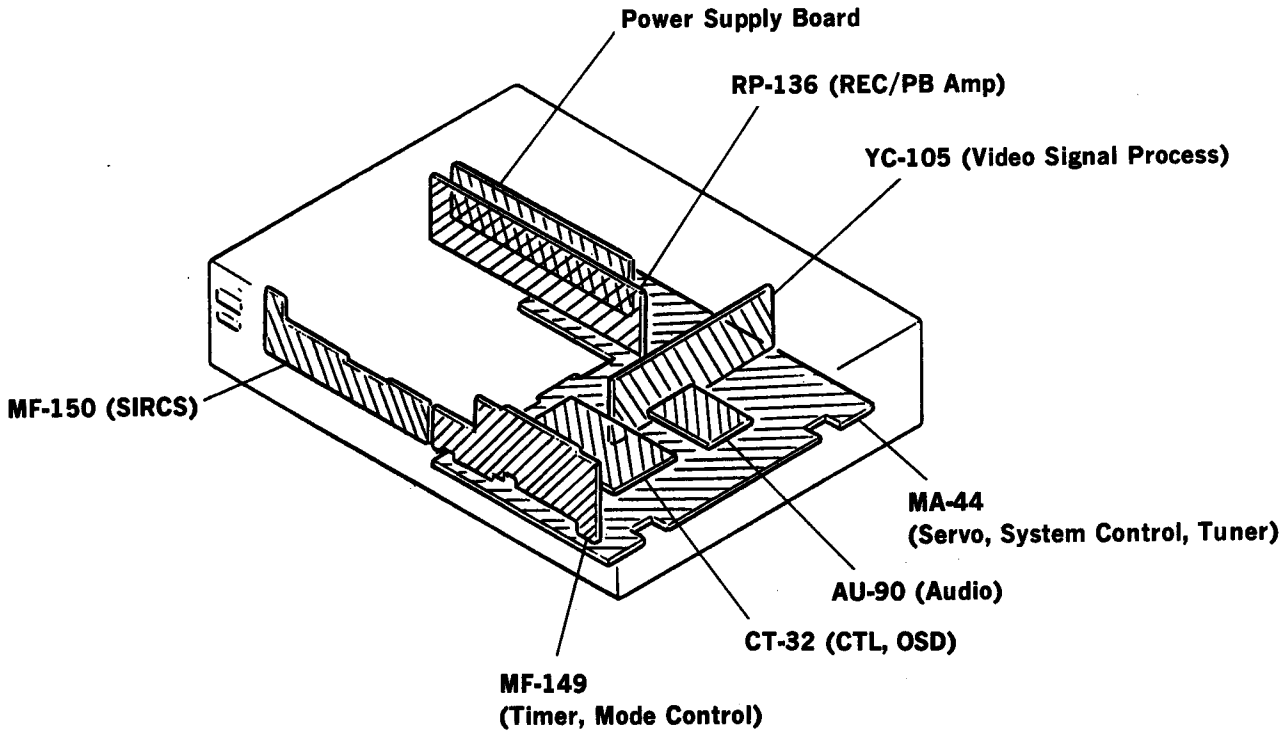


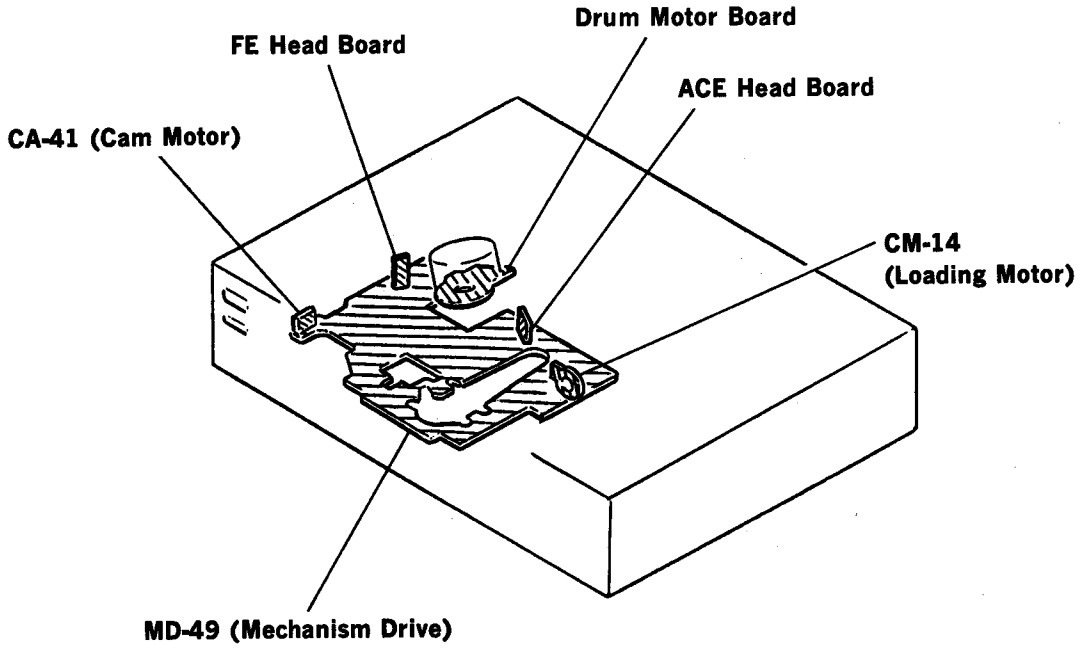
— Bottom Side —



SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION





3-10. SYSTEM CONTROL MICROCOMPUTER (CXP80116 : IC501 on MA-44 Board) PORT FUNCTIONS DESCRIPTION

Port	Pin No.	Signal	I/O	Description
PA0	2	$\overline{\text{JOG}}$	O	L in variable speed
PA1	1	$\overline{\text{V-PB}}$	O	L in PB mode
PA2	80	REC	O	H in REC or REC-PAUSE mode
PA3	79	REC/$\overline{\text{P}}$	O	H during record
PA4	78	LP	O	H in LP mode
PA5	77	$\overline{\text{SP}}$	O	L in SP mode
PA6	76	A-MUTE	O	Audio mute signal
PA7	75	$\overline{\text{TV}}$/VTR	O	TV/VTR selection
PB0	10	LINE1	O	Input control 1
PB1	9	LINE2	O	Input control 2
PB2	8	NC	O	
PB3	7	NA-PB	O	Normal audio PB
PB4	6	Q-VD/V MUTE	O	Quasi VD signal/V mute
PB5	5	RF SWP	O	RF switching pulse
PB6	4	OSD-VD	O	Quasi VD for OSD (This is different logically from the quasi VD.)
PB7	3	HEAD-SEL	O	Head select signal
PC0	18	CAM	O	Cam select signal
PC1	17	LOAD	O	Load select signal
PC2	16	CW/$\overline{\text{CCW}}$	O	Rotation direction set
PC3	15	CTL-INV	O	CTL inversion
PC4	14	REC/$\overline{\text{P}}$	O	Inversion signal of REC/$\overline{\text{P}}$
PC5	13	NC	O	
PC6	12	EDIT	O	H during edit
PC7	11	REC CTL	O	REC CTL output
EXTAL	35	EXTAL	I	System clock. 16 MHz crystal
XTAL	34	XTAL	O	

Port	Pin No.	Signal	I/O	Description
PD0	26	AMS	O	AMS control
PD1	25	TA-MUTE	I	Tuner audio mute signal input
PD2	24	REC/$\overline{P}$ (OD)	O	REC/P 3 state output (HiZ/L)
PD3	23	STEP-DRIVE	O	H when step is operational.
PD4	22	MODE4	I	MD encoder input (MSB) ↓ (LSB)
PD5	21	MODE3	I	
PD6	20	MODE2	I	
PD7	19	MODE1	I	
PE0	70	DEW	I	Not used
PE1	69	VD-CTL	I	CTL counter input
PE2	68	LAMP	O	End sensor lamp signal
PE3	67	CAP STOP	O	Capstan ON/OFF
PE4	66	DRM-DA	O	Drum DA output
PE5	65	CAP-DA	O	Capstan DA output
PE6	64	CAP-RVS	O	Capstan inversion
PE7	63	INDEX $\overline{CS}$	O	INDEX CHIP-SEL signal.
PF0	47	CAP-V	I	Capstan constant voltage FB input
PF1	46	C-UP/$\overline{DWN}$	I	Cassette UP/DOWN
PF2	45	S-REEL	I	S reel FG
PF3	44	T-REEL	I	T reel FG
PH0	30	$\overline{FULL\text{-}ERASE}$	O	Full erase ON
PH1	29	$\overline{OSDV\text{-}SEL}$	O	OSD-VD signal select
PH2	28	$\overline{STEP\text{-}PLS}$	O	Step pulse output
PH3	27	SLOW-STILL	O	H in SLOW/STILL mode
$\overline{RST}$	32	$\overline{RESET}$	I	Reset input
MP	31	MP	I	Microprocessor mode input (L always set)

Port	Pin No.	Signal	I/O	Description
PG0	62	CAP-FG	I	Capstan FG input
PG1	61	DRM-FG	I	Drum FG input
PG2	60	DRM-PG	I	Drum PG input
PG3	59	$\overline{\text{PB-CTL}}$	I	PB-CTL input
PG4	58	COMP-SYNC	I	Composite sync input
PG5	57	S-SENS	I	S end sensor
PG6	56	T-SENS	I	T end sensor
PG7	55	REC-PRF	I	REC-PROOF switch
AN0	51	SW-POSI	I	Switch position adjustment
AN1	50	NC	I	
AN2	49	VIDEO-RF	I	Video RF input
AN3	48	VIDEO-DOC	I	Video DOC input (Not used)
CS0	36	$\overline{\text{CS0}}$	I	Serial line for TT handscake
SI0	37	SI0	I	
SO0	38	SO0	O	
SCK0	39	$\overline{\text{SCLK0}}$	I	
CS1	40	S CS 1	I	<--not used
SI1	41	S IN 1	I	Serial line for INDEX handscake
SO1	42	S OUT 1	O	
SCK1	43	S CLOCK 1	I/O	
AV_{DD}	54	AV_{DD}	—	A/D converter. Positive power supply terminal
AV_{REF}	53	AV_{REF}	I	A/D converter. Reference voltage input
AV_{SS}	52	AV_{SS}	—	A/D converter. GND
V_{DD}	72	V_{DD}	—	Positive power supply terminal
V_{SS}	33/73	V_{SS}	—	GND
$\overline{\text{NMI}}$	71	$\overline{\text{NMI}}$	I	Non-maskable interruption input (H in no use)

3-11. MODE CONTROL MICROCOMPUTER (CXP50116 : IC001 on MF-149 Board)
PORT FUNCTIONS DESCRIPTION

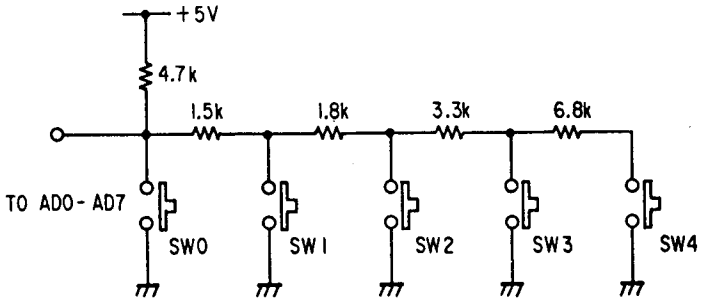
Port	Pin No.	Signal	I/O	Description
V_{DD}	34	V_{DD}	—	Positive power supply terminal
V_{SS}	71	V_{SS}	—	GND
EXTAL	74	EXTAL	I	Clock input (4.194304 MHz)
XTAL	72	XTAL	O	Clock output
TEX	31	TEX	I	Backup clock input (32.768 kHz)
TX	30	TX	O	Backup clock output
PA3	50	DIST2	I	Destination setting port (MSB ↕ LSB)
PA2	49	DIST1	I	
PA1	48	DIST0	I	
PA0	47	$\overline{\text{H-DET}}$	I	VIDEO H-sync DETECT input
PC3	70	$\overline{\text{CG-CS}}$	O	OSD CS signal
PC2	69	$\overline{\text{COSMO-CS}}$	O	COSMO CS signal
PC1	68	NC	O	
PC0	67	NC	O	
PD3	66	MEM-CLK	O	EEP-ROM clock signal
PD2	65	MEM-CS	O	EEP-ROM CHIP-SEL signal
PD1	64	POWER-ON	O	Power control (H when the power is on.)
PD0	63	$\overline{\text{COSMO-RST}}$	O	COSMO reset signal
PE3	58	MEM-DATA	I/O	EEP-ROM data signal
PE2	57	MEM-TYPE	I	EEP-ROM type setting. H : 93C56
PE1	56	AFT-UP	I	Tuner AFT-UP signal
PE0	55	AFT-DOWN	I	Tuner AFT-DOWN signal
PE3	54	U/CLK	O	FS tuner clock output
PF2	53	VH/LATCH	O	FS tuner latch output
PF1	52	VL/DATA	O	FS tuner data output
PF0	51	TA-MUTE	O	Tuner audio mute

Port	Pin No.	Signal	I/O	Description
PH3	80	SYSTEM3	O	System control output 3 (P-channel OD)
PH2	79	SYSTEM2	O	System control output 2 (P-channel OD)
PH1	78	SYSTEM1	O	System control output 1 (P-channel OD)
PH0	77	NC	O	
PY3	62	SIRCS-IN	I	Remote control input
PY2	61	POWER-FAIL	I	Service interruption detection
PY1	60	VC-PWM	O	Pulse output for buzzer
PY0	59	$\overline{NC}$	O	
AD7	42	AD7	I	Key input reading A/D (including shuttle switch)
AD6	41	AD6		
AD5	40	AD5		
AD4	39	AD4		
AD3	38	AD3		
AD2	37	AD2		
AD1	36	AD1		
AD0	35	AD0		
T9	19	T9	O	FIP grid signal
|	|	|		
T0	28	T0		
S21	18	S17	O	Clock for buzzer (Not used)
S20	17	S16	O	FIP segment signal
|	|	|		
S4	1	S0		
V_{FDP}	76	V_{FDP}	I	Power supply for FDP
V_{REF}	75	V_{REF}	I	Reference voltage for resetting circuit (to Vdd)

Port	Pin No.	Signal	I/O	Description
$\overline{EC}$	43		I	Event count input (Not used)
INT	29		I	Interruption from externals (Not used)
$\overline{RESET}$	32	$\overline{RESET}$	I	Reset input
$\overline{SC}$	44	$\overline{SCLK}$	O	Serial bus clock output
SO	45	SO (from TT)	O	Serial bus S OUT
SI	46	SI (to TT)	I	Serial bus S IN

• A/D PORT ALLOCATION

• The A/D ports are allocated as shown below.



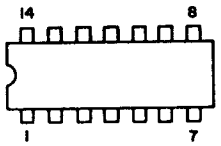
AD \ SW	Pin	SW0 3.70 [V]	SW1 2.92 [V]	SW2 2.06 [V]	SW3 1.21 [V]	SW4 0.00 [V]
AD0	35	RING0	—	TEST	R. MODE1	R. MODE2
AD1	36	RING1	—	—	—	—
AD2	37	RING2	—	—	—	—
AD3	38	FWD/$\overline{RVS}$	PAUSE	H. SPEED REW	—	—
AD4	39	STOP	PLAY	POWER	EJECT	—
AD5	40	REC	AUTO/MANUAL	TRACK (−)	CH (+)	TV/VTR
AD6	41	TMR ON/OFF	EDIT	TRACK (+)	CH (−)	—
AD7	42	QUICK TMR	—	INPUT SEL	—	TAPE SPEED

• KEY input signals pass through the A/D ports as shown above.
• Chattering-cancel time is 30 msec. KEY input is assumed when there are two input signals of the same voltage within 30 msec.
• Remote control modes are selected by R. MODE 1/2.

Remote control mode	VTR1	VTR2	VTR3
R. MODE1	make	brake	brake
R. MODE2	brake	make	brake

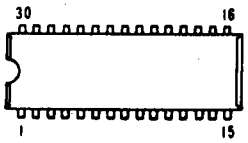
4-3. SEMICONDUCTORS

BA10324
CXL5502P
LM324N



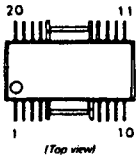
(TOP VIEW)

HA118019NT
LC6543H-4374



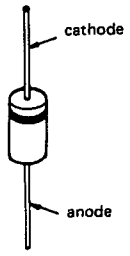
(Top view)

TA8424F

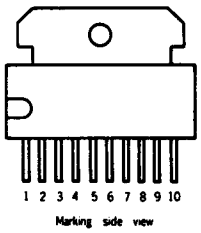


2SK381-B

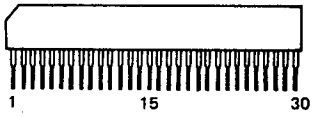
RD5.1E-L2



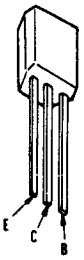
BA6238A



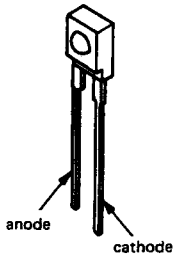
LA7297



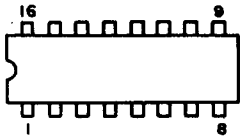
DTA114ES
DTA144ES



GL451VS1

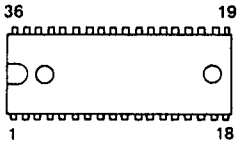


TA8731P
μPD4052BC-A



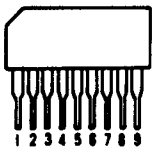
(TOP VIEW)

LA7383B

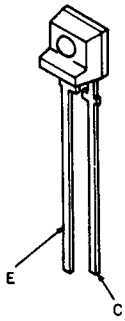


(TOP VIEW)

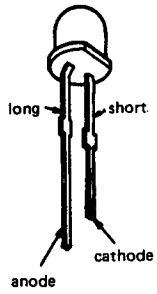
BA7021
LVA519S



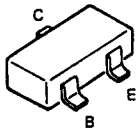
PT483F1S



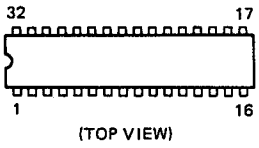
SEL2510C-D



2SA1162
2SC1623
DTA143EK
DTA144EK
DTA144WK
DTC144EK
DTC144WK

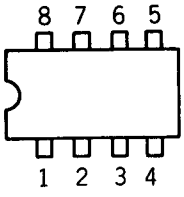


M50554-182SP



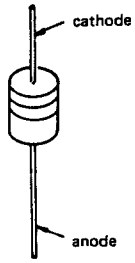
(TOP VIEW)

CAT93C46P
RC4560D

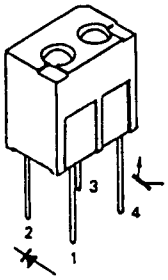


(Top view)

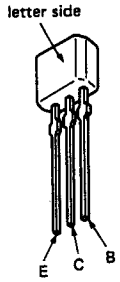
11ES2
1SR139-100
1SS119
RD33ES-B2
RD6.2ES-B1
RD6.8ES-B1
RD6.8ES-B2
RD8.2ES-B2



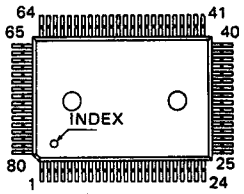
PS6002



2SA1175-HFE
2SC2785-HFE
DTA124ES
DTC144ES



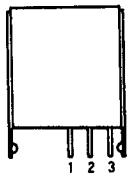
CXP50116-269Q
CXP80116-846Q



MARKING SIDE VIEW

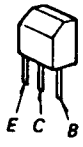
PST529C
PST529H

GP1U52X

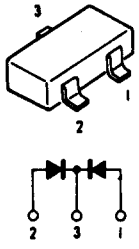


1 Vout
2 Vcc
3 GND

2SD774-34



MA152WK



SECTION 5
EXPLODED VIEWS

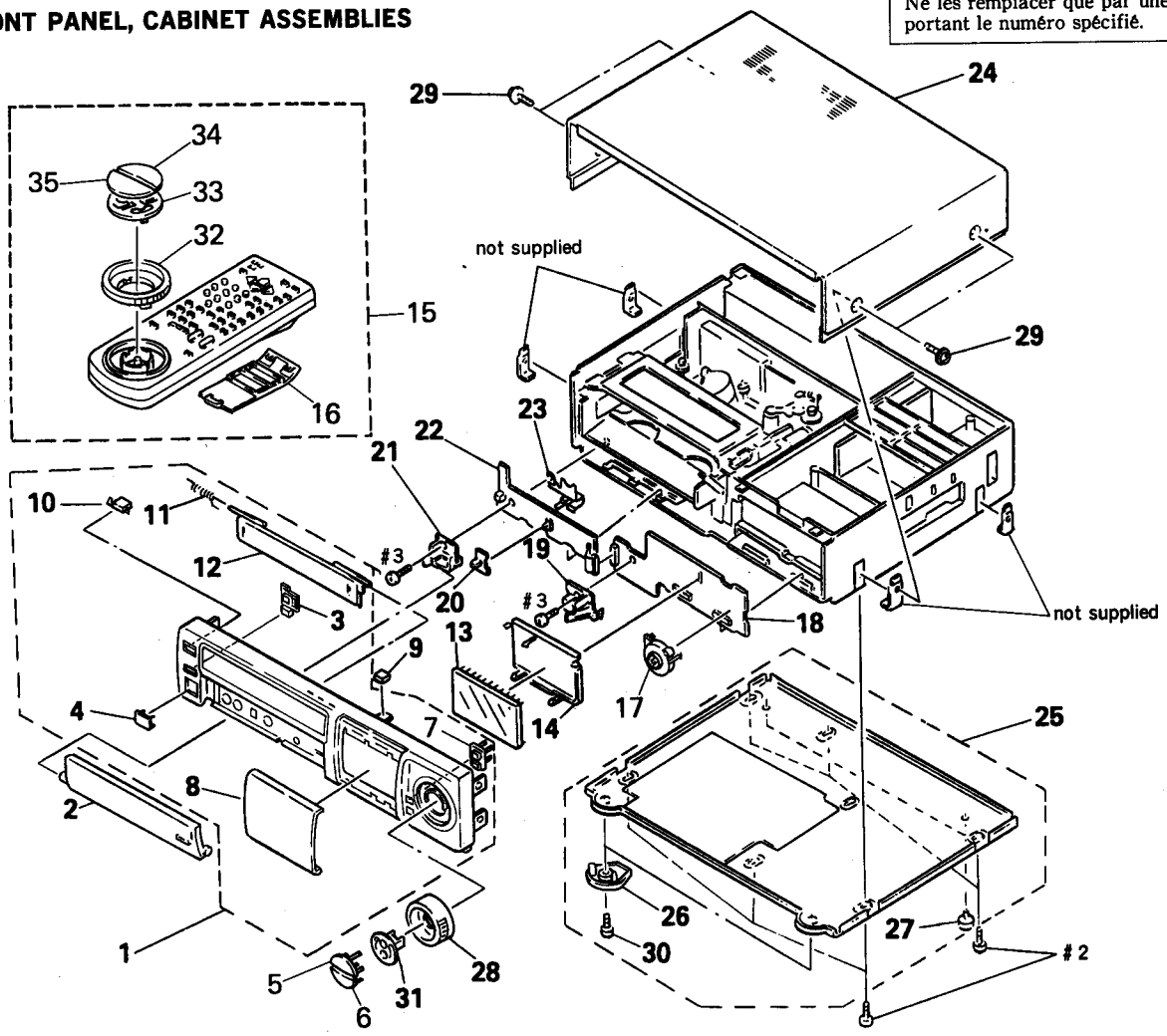
NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ ↑
  Parts Color Cabinet's Color
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

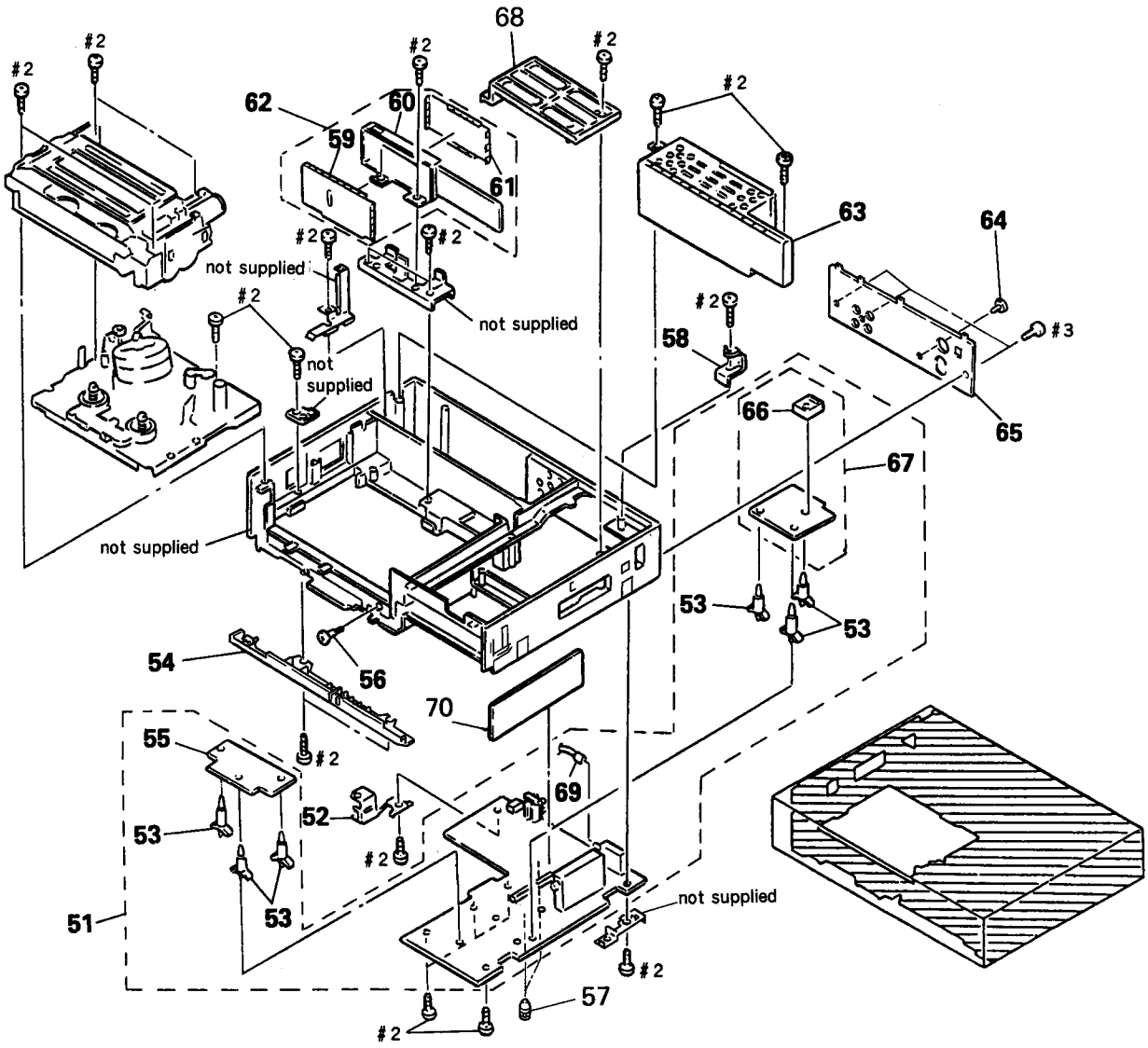
5-1. FRONT PANEL, CABINET ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3941-192-1	PANEL ASSY, FRONT	
2	1-466-652-11	SWITCH BLOCK, CONTROL	
3	3-943-980-11	BUTTON, POWER-EJECT	
4	3-741-981-61	WINDOW, LAY CATCHER BLOCK	
5	3-943-986-11	BUTTON, PLAYBACK	
6	3-943-987-11	BUTTON, STOP	
7	3-943-985-21	BUTTON, PAUSE	
8	3-943-984-21	PLATE, TRANSPARENT	
9	9-911-841-XX	CUSHION (B)	
10	3-944-748-01	CHIP, POWER BUTTON	
11	3-944-750-01	SPRING, FL	
12	3-944-740-21	DOOR, CASSETTE	
13	1-519-580-11	INDICATOR TUBE, FLUORESCENT	
14	3-744-220-01	HOLDER, FL	
15	1-465-961-11	REMOTE COMMANDER (RMT-V102C)	
16	3-943-535-01	COVER, BATTERY	
17	1-572-662-11	SWITCH, ROTARY (DUAL MODE SHUTTLE)	
* 18	A-6721-445-A	MF-149 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remark
19	3-741-967-11	PLATE (RIGHT), FULCRUM, DOOR	
20	3-744-217-01	KNOB, SELECTION	
21	3-741-966-01	PLATE (LEFT), FULCRUM, DOOR	
* 22	A-6756-335-A	MF-150 BOARD, COMPLETE	
* 23	3-741-968-01	PLATE, GROUND, MF	
24	X-3733-313-1	CASE, UPPER	
25	X-3941-031-1	PLATE ASSY, BOTTOM	
26	3-941-509-01	INSULATOR	
27	3-670-155-11	LEG	
28	3-941-512-01	RING, SHUTTLE	
29	3-710-901-11	SCREW, TAPPING	
30	3-721-343-01	SCREW, FIXED, M4X7	
31	3-943-990-01	HOLDER, BUTTON	
32	3-941-616-01	RING, SHUTTLE	
33	3-941-619-01	HOLDER, DIAL	
34	3-941-617-01	BUTTON, PLAYBACK	
35	3-941-618-01	BUTTON, STOP	

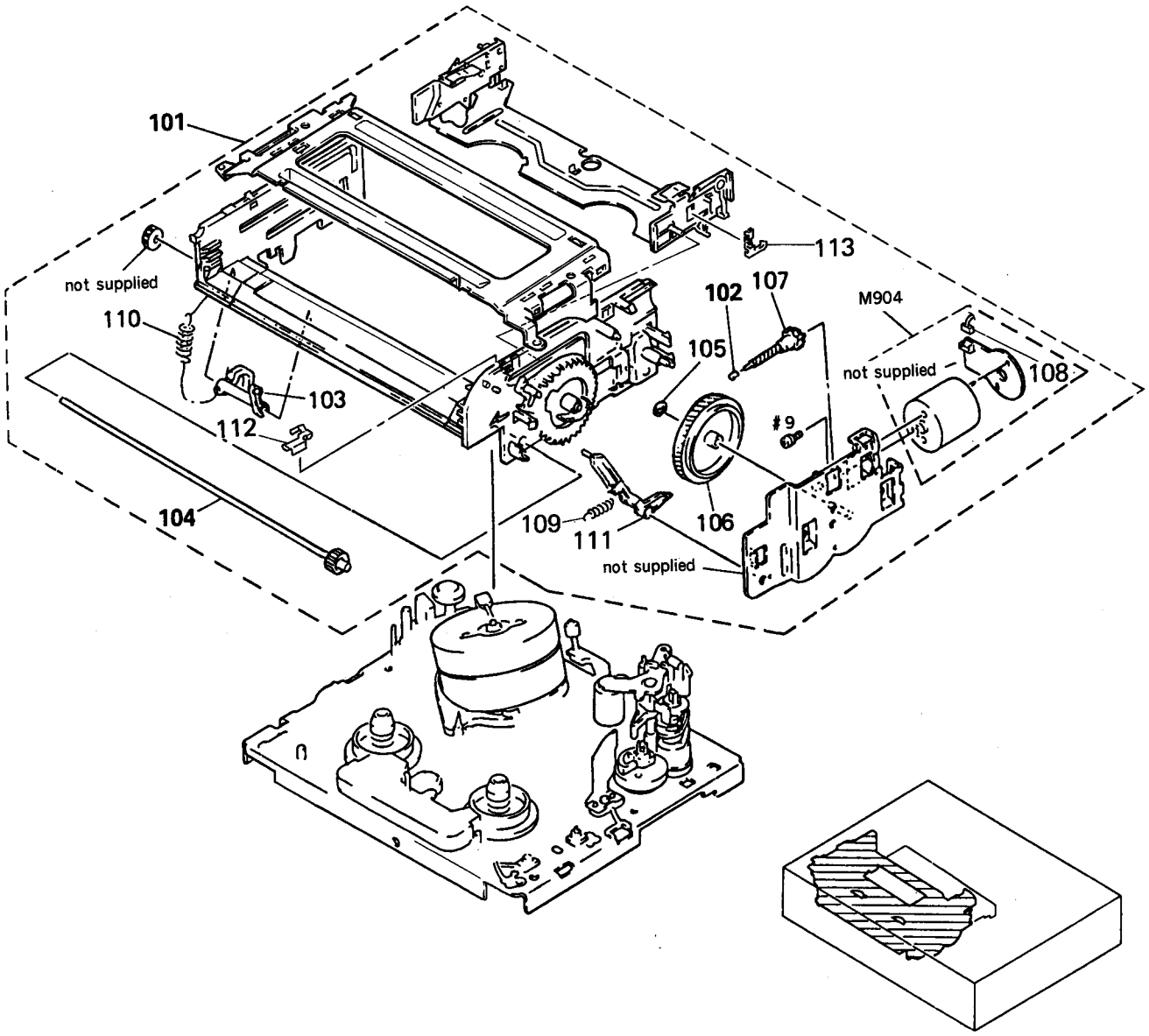
5-2. CHASSIS ASSEMBLY



Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

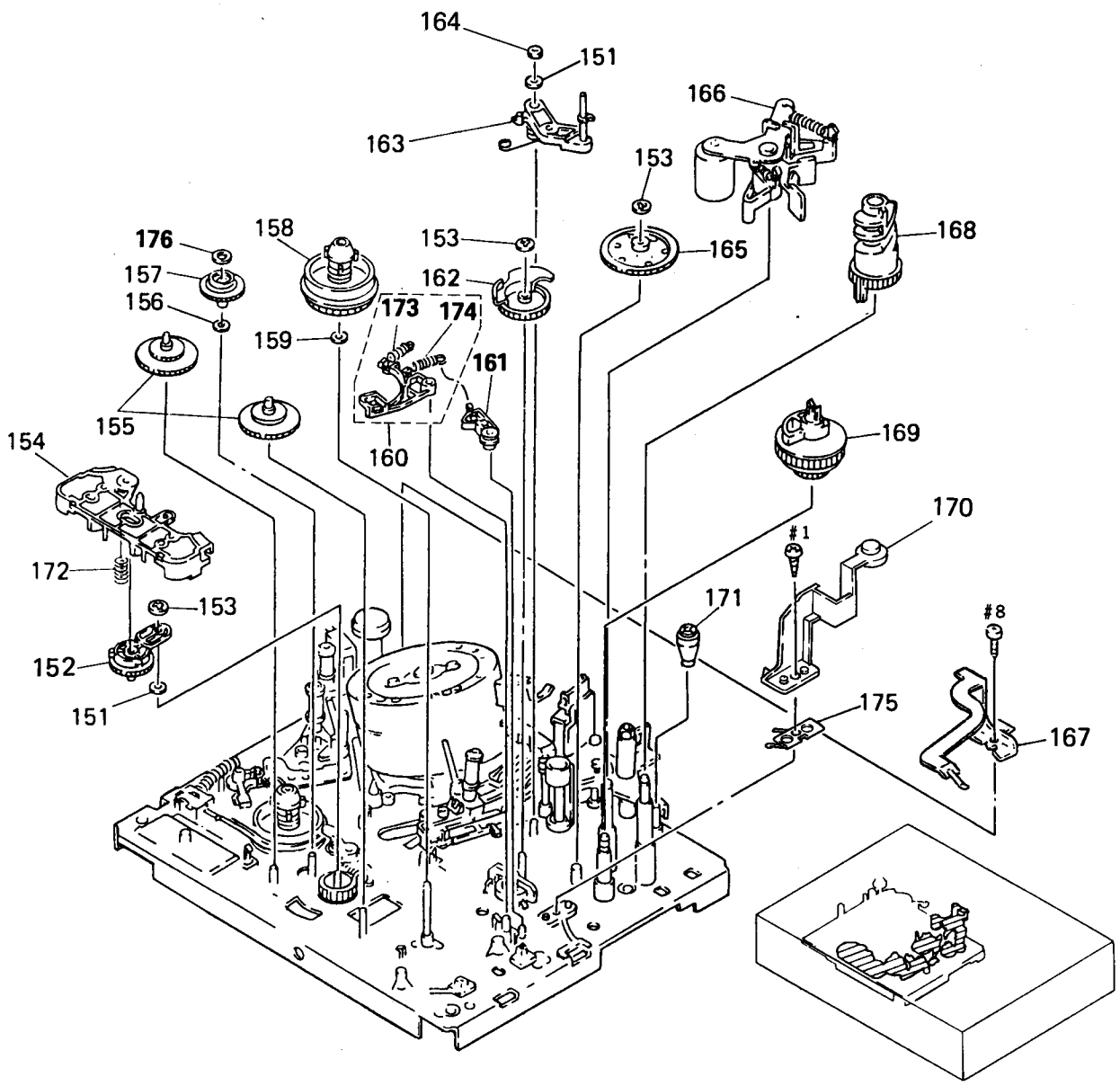
Ref. No.	Part No.	Description	Remark
* 51	A-6755-336-A	MA-44 BOARD, COMPLETE	
* 52	3-741-962-11	PLATE, GROUND, JMP	
* 53	4-924-098-91	HOLDER, PC BOARD	
54	3-943-989-21	ESCUTCHEON, FRAME	
* 55	A-6754-076-A	CT-32 BOARD, COMPLETE	
56	3-741-948-11	SCREW (3), SPECIAL (+) TAPPING	
57	3-682-057-11	SPACER (SMALL)	
* 58	3-741-963-01	BRACKET, RF	
* 59	3-741-957-11	CASE (LID), SHIELD, RP	
* 60	3-741-956-11	CASE (MAIN), SHIELD, RP	
* 61	3-741-958-11	CASE (BOTTOM), SHIELD, RP	
* 62	A-6727-402-A	RP-136 BOARD, COMPLETE	
⚠63	1-413-540-11	POWER BLOCK (US, CND)	
⚠63	1-413-559-11	POWER BLOCK (PX)	
64	3-531-576-21	RIVET	
* 65	3-744-279-81	PLATE (GA), ORNAMENTAL, JACK (US, CND)	
* 65	3-744-279-91	PLATE (GA), ORNAMENTAL, JACK (PX)	
* 66	3-744-216-01	CASE, SHIELD, AU	
* 67	A-6754-087-A	AU-90 BOARD, COMPLETE	
* 68	3-744-219-01	HOLDER (M2), FRAME	
* 69	1-555-110-11	CABLE, PIN	
* 70	A-6727-407-A	YC-105 BOARD, COMPLETE	

5-3. FL CASSETTE COMPARTMENT



Ref. No.	Part No.	Description	Remark
101	A-6751-397-A	FL BLOCK ASSY	
102	3-716-144-02	RETAINER, WORM	
103	3-736-163-01	LEVER, ERASING PROTECTION	
104	X-3727-775-2	GEAR (RIGHT) ASSY, MIDWAY	
105	3-696-510-01	WASHER (3), STOPPER	
106	3-736-164-01	WHEEL (FL), WORM	
107	3-736-100-01	GEAR (FL), WORM	
108	1-506-482-11	CONNECTOR 3P, MALE	
109	3-739-687-01	SPRING, TENSION	
110	3-738-285-01	SPRING, TENSION	
111	3-736-167-01	ARM, DOOR SWITCHING	
* 112	3-744-011-01	PLATE, GROUND, TOP PLATE	
113	3-736-129-06	LEVER, RELEASE, LID LOCK	
M904	X-3727-784-1	MOTOR ASSY (LOADING)	

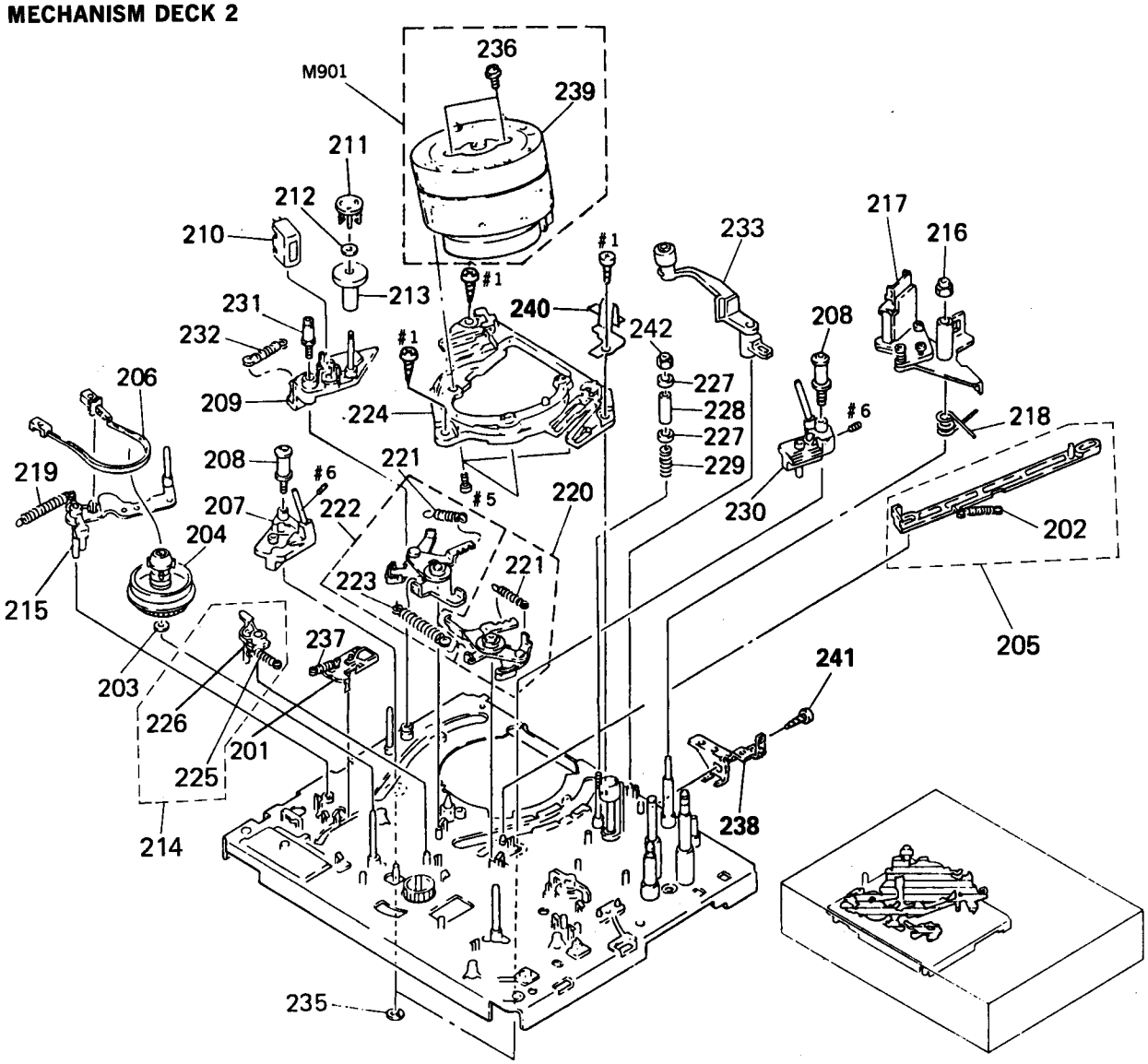
5-4. MECHANISM DECK 1



Ref. No.	Part No.	Description	Remark
151	3-701-438-11	WASHER, 2.5	
152	X-3727-776-1	ARM ASSY, PENDULUM	
153	3-669-595-00	WASHER (2), STOPPER	
154	3-736-172-02	RELEASE, LOCK, REEL	
155	X-3727-795-1	GEAR ASSY, RELAY	
156	3-736-074-01	RETAINER (SMALL), THRUST	
157	3-736-037-01	GEAR, REW	
158	X-3727-798-1	TABLE ASSY, REEL	
159	3-738-212-21	RETAINER, THRUST, REEL TABLE	
160	X-3727-764-4	BRAKE ASSY, T SOFT	
161	3-736-105-01	ARM, REV BRAKE	
162	3-736-143-01	GEAR, RVS CAM	
163	X-3729-911-1	ARM ASSY, RVS	

Ref. No.	Part No.	Description	Remark
164	3-736-740-01	NUT (M2X0.25), NYLON	
165	3-736-116-01	GEAR, COMMUNICATION	
166	X-3727-770-1	PINCH ROLLER BLOCK ASSY	
167	X-3733-304-1	GROUND ASSY, SHAFT	
168	3-736-136-01	CAM, ELEVATOR	
169	3-943-700-01	GEAR (LO), PRESS CAM	
170	3-942-828-01	OPENNER, LID	
171	3-738-250-01	SCREW, AC ADJUSTMENT	
172	3-736-020-11	SPRING, COMPRESSION	
173	3-736-024-01	SPRING, TENSION	
174	3-736-025-01	SPRING (REV BRAKE), TENSION	
175	3-942-829-01	SPRING (2) (ATOM), GROUND, FL	
176	3-736-069-01	RETAINER, SPRING	

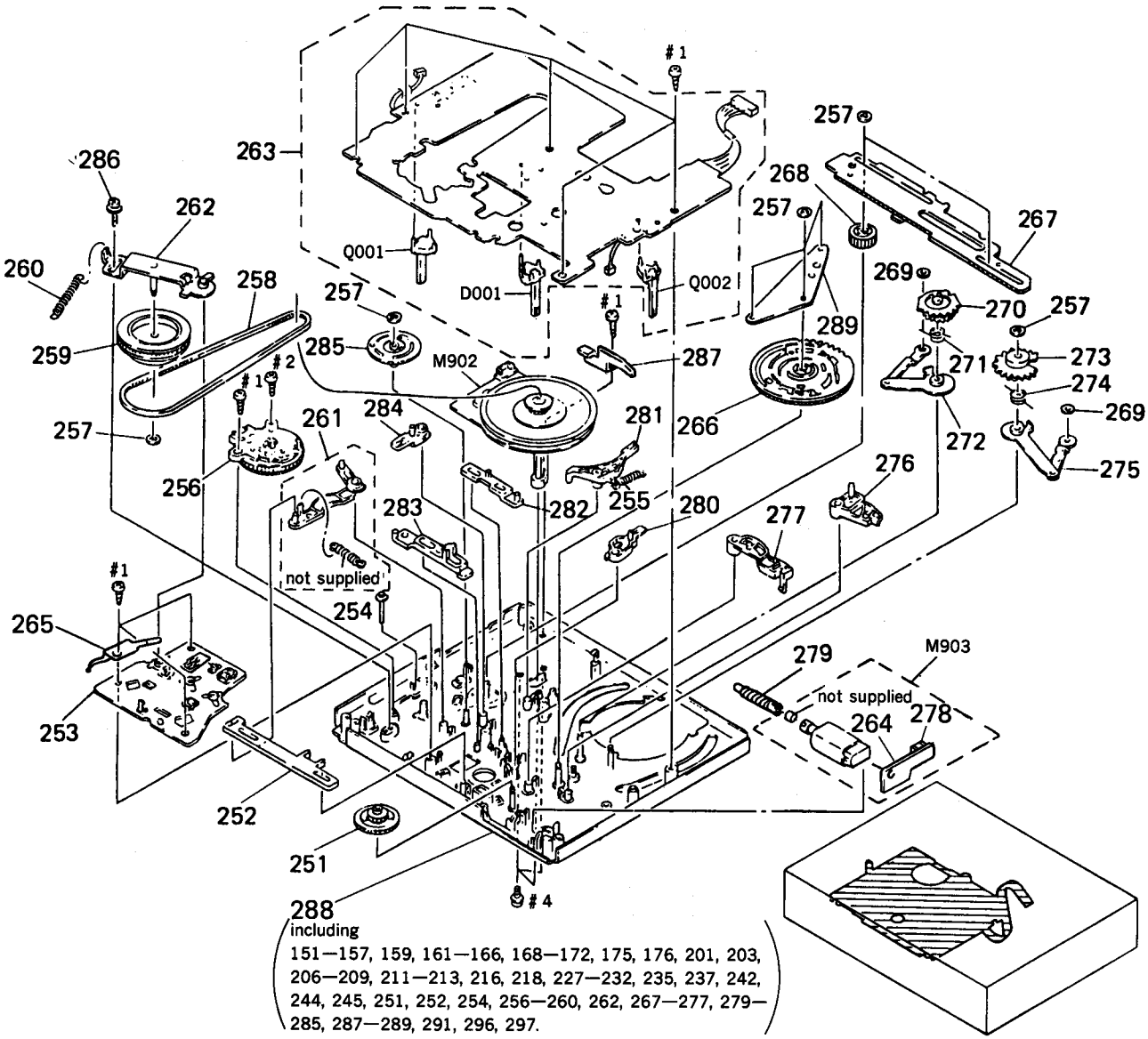
5-5. MECHANISM DECK 2



Ref. No.	Part No.	Description	Remark
201	A-6759-451-A	TAKE-UP BLOCK ASSY, S	
202	3-736-735-03	SPRING, TENSION	
203	3-738-212-21	RETAINER, THRUST, REEL TABLE	
204	X-3941-194-1	TABLE ASSY, REEL, S	
* 205	X-3743-517-1	LEVER ASSY(S), RELEASE, C ROLLER	
206	X-3727-797-1	BAND ASSY, TENSION REGULATOR	
207	X-3727-786-1	SHUTTLE (LEFT) ASSY	
208	X-3733-301-1	ROLLER ASSY, GUIDE	
209	X-3727-767-1	BASE ASSY, STABILIZER	
210	1-543-647-11	HEAD, FE	
211	3-736-082-01	RETAINER, TS THRUST	
212	3-741-925-01	RING, RETAINING	
213	X-3727-771-1	STABLILIZER ASSY, TAPE	
214	X-3727-773-1	ARM ASSY, S SOFT BRAKE	
215	X-3727-772-5	ARM ASSY, TENSION REGULATOR	
216	3-942-867-01	NUT, AC HEIGHT ADJUSTMENT	
217	A-6761-129-C	HEAD BLOCK ASSY, ACE	
218	3-944-833-01	SPRING, TORSION	
219	3-733-389-11	SPRING, TENSION	
220	X-3729-926-1	BRAKE ASSY (2), T	
221	3-738-220-01	SPRING (MAIN BRAKE 2), TENSION	
222	X-3729-925-1	BRAKE ASSY (2), S	

Ref. No.	Part No.	Description	Remark
223	3-738-221-01	SPRING (MAIN BRAKE 1), TENSION	
224	X-3727-791-2	BASE ASSY, DRUM	
225	3-736-047-01	SPRING (S SOFT), TENSION	
226	3-736-075-01	BRAKE, S SOFT	
227	3-944-033-01	FLANGE, 7 GUIDE	
228	3-736-730-01	SLEEVE, #7 GUIDE	
229	3-749-099-01	SPRING (#7 GUIDE), COMPRESSION	
230	X-3727-787-1	SHUTTLE (RIGHT) ASSY	
231	X-3727-788-1	ROLLER ASSY, GUIDE, #2	
232	3-736-745-01	SPRING	
233	A-6747-267-A	ARM BLOCK ASSY (S), C ROLLER	
235	3-736-073-01	SLIDER, POLYETHYLENE	
236	2-643-205-01	SCREW, FITTING +PW 3X8, UPPER DRUM	
237	3-738-284-01	SPRING, TENSION	
* 238	3-738-249-01	PLATE, FIXED, MD	
239	8-848-543-01	UPPER DRUM ASSY (DZR-25-R)	
* 240	X-3733-328-1	PLATE ASSY, GROUND, DRP	
241	3-736-055-01	SCREW (3X8), TAPPING	
242	3-942-866-01	NUT (M3) (3X0.5), NYLON	
M901	8-848-541-11	DRUM ASSY (DZH-25A-R)	

5-6. MECHANISM DECK 3



Ref. No.	Part No.	Description	Remark
251	3-736-015-01	WHEEL (CAM), WORM	
252	3-736-158-01	PLATE, SLIDE, PENDULUM	
253	A-6739-084-A	CHASSIS BLOCK ASSY, SUB	
254	3-736-091-01	PIN, SWITCH	
255	3-738-237-01	SPRING (CAP BRAKE), TENSION	
256	1-692-062-11	SWITCH, ROTARY	
257	3-669-595-00	WASHER (2), STOPPER	
258	3-736-013-01	BELT, TIMING	
259	X-3727-782-1	PULLEY ASSY	
260	3-736-089-01	SPRING, TENSION	
261	X-3729-924-1	ARM ASSY, PENDULUM FUNCTION	
262	X-3727-761-1	ARM ASSY, ADJUSTMENT	
* 263	A-6754-278-A	MD-49 BOARD, COMPLETE	
* 264	1-633-460-11	CA-41 BOARD	
265	3-741-950-01	SPRING (AT), LEAF, SC GROUND	
266	3-736-176-01	GEAR, CAM	
267	3-736-177-01	PLATE, SLIDE, MODE	
268	3-733-394-01	GEAR, RVS RELAY	
269	3-736-073-01	SLIDER, POLYETHYLENE	
270	3-736-148-01	GEAR (RIGHT), THREADING	
271	3-736-092-01	SPRING (RIGHT), TORSION	
272	X-3727-777-1	ARM (RIGHT) ASSY, THREADING	
273	3-736-147-01	GEAR (LEFT), THREADING	
274	3-736-040-01	SPRING (LEFT), TORSION	
275	X-3727-778-1	ARM (LEFT) ASSY, THREADING	
276	3-736-142-01	ARM, TENSION REGULATOR FUNCTION	
277	3-736-140-01	ARM, S TAKE-UP	
278	1-506-482-11	CONNECTOR 3P, MALE	
279	3-733-395-01	GEAR (CAM), WORM	
280	3-733-397-01	ARM, BRAKE FUNCTION	
281	X-3727-769-1	BRAKE ASSY, CAP	
282	3-733-398-01	PLATE, SLIDE, BRAKE	
283	3-736-103-01	PLATE, SLIDE, LIMITER	
284	3-736-016-01	ARM, LIMITER FUNCTION	
285	3-736-170-01	GEAR, RKB CAM	
286	3-733-386-01	SCREW (3X8), WASHER	
287	3-736-744-01	RETAINER, ROTOR	
288	A-6773-228-A	MD BLOCK ASSY	
289	3-733-396-01	HOLDER, CAM GEAR	
D001	8-719-985-00	DIODE GL451VS1	
M902	8-835-389-03	MOTOR, DC U-26D (CAPSTAN)	
M903	X-3733-302-1	MOTOR ASSY, CAM	
Q001	8-729-926-31	PHOTO TRANSISTOR PT483FIS	
Q002	8-729-926-31	PHOTO TRANSISTOR PT483FIS	

AU-90

SECTION 6
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS
  uF : μF
- RESISTORS
  All resistors are in ohms
  METAL : Metal-film resistor
  METAL OXIDE : Metal Oxide-film resistor
  F : nonflammable
- COILS
  uH : μH
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD....

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
*	A-6754-087-A	AU-90 BOARD, COMPLETE			
		**********			
		(Ref. No 3,000 Series)			
*	3-744-216-01	CASE, SHIELD, AU			
		< CAPACITOR >			
C047	1-161-051-00	CERAMIC	0.01uF	10%	50V
C051	1-161-051-00	CERAMIC	0.01uF	10%	50V
C201	1-136-558-11	FILM	0.0039uF	10%	630V
C202	1-109-675-11	MICA	120PF	1%	500V
C203	1-124-477-11	ELECT	47uF	20%	25V
C204	1-161-051-00	CERAMIC	0.01uF	10%	50V
C205	1-164-087-11	CERAMIC	0.0015uF	10%	50V
C206	1-124-903-11	ELECT	1uF	20%	50V
C207	1-162-286-31	CERAMIC	220PF	10%	50V
C208	1-102-118-00	CERAMIC	0.0012uF	10%	50V
C209	1-124-477-11	ELECT	47uF	20%	25V
C210	1-124-477-11	ELECT	47uF	20%	25V
C211	1-164-087-11	CERAMIC	0.0015uF	10%	50V
C212	1-124-477-11	ELECT	47uF	20%	25V
C213	1-164-083-11	CERAMIC	680PF	10%	50V
C214	1-124-903-11	ELECT	1uF	20%	50V
C215	1-164-092-11	CERAMIC	0.0033uF	10%	25V
C216	1-124-903-11	ELECT	1uF	20%	50V
C217	1-124-252-00	ELECT	0.33uF	20%	50V
C218	1-124-903-11	ELECT	1uF	20%	50V
C219	1-124-477-11	ELECT	47uF	20%	25V
C220	1-161-051-00	CERAMIC	0.01uF	10%	50V
C221	1-124-903-11	ELECT	1uF	20%	50V
C222	1-124-903-11	ELECT	1uF	20%	50V
C223	1-161-049-00	CERAMIC	0.0068uF	10%	50V
C224	1-164-086-11	CERAMIC	0.0012uF	10%	50V
C225	1-164-085-11	CERAMIC	0.001uF	10%	50V
C226	1-124-234-00	ELECT	22uF	20%	16V
C228	1-161-055-00	CERAMIC	0.022uF	10%	50V
C229	1-126-163-11	ELECT	4.7uF	20%	50V

Ref. No.	Part No.	Description				Remark
		< CONNECTOR >				
* CN201	1-560-892-00	PIN, CONNECTOR 4P				
* CN203	1-560-890-00	PIN, CONNECTOR 2P				
CN204	1-506-474-11	CONNECTOR 9P, MALE				
		< IC >				
IC201	8-759-805-20	IC LA7297				
		< COIL >				
L201	1-410-120-11	INDUCTOR 1.2mH				
L202	1-412-092-11	INDUCTOR, SMALL TYPE 223uH				
L203	1-408-247-00	INDUCTOR 33mH				
		< TRANSISTOR >				
Q201	8-729-140-96	TRANSISTOR 2SD774-34				
		< RESISTOR >				
R201	1-249-432-11	CARBON	18K	5%	1/4W	
R202	1-249-429-11	CARBON	10K	5%	1/4W	
⚠ R203	1-249-387-11	CARBON	3.3	5%	1/4W	
R204	1-249-429-11	CARBON	10K	5%	1/4W	
R205	1-249-429-11	CARBON	10K	5%	1/4W	
R206	1-249-441-11	CARBON	100K	5%	1/4W	
R207	1-249-429-11	CARBON	10K	5%	1/4W	
R208	1-249-393-11	CARBON	10	5%	1/4W	
R209	1-249-429-11	CARBON	10K	5%	1/4W	
R210	1-249-436-11	CARBON	39K	5%	1/4W	
R211	1-249-429-11	CARBON	10K	5%	1/4W	
R212	1-249-407-11	CARBON	150	5%	1/4W	
R213	1-247-885-00	CARBON	180K	5%	1/4W	
R214	1-249-411-11	CARBON	330	5%	1/4W	
R215	1-249-429-11	CARBON	10K	5%	1/4W	
R216	1-249-430-11	CARBON	12K	5%	1/4W	
R217	1-249-434-11	CARBON	27K	5%	1/4W	
R218	1-249-407-11	CARBON	150	5%	1/4W	
R219	1-249-422-11	CARBON	2.7K	5%	1/4W	
R220	1-249-423-11	CARBON	3.3K	5%	1/4W	

Ref. No.	Part No.	Description			Remark
R222	1-249-428-11	CARBON	8.2K	5%	1/4W
R223	1-247-903-00	CARBON	1M	5%	1/4W
R224	1-249-411-11	CARBON	330	5%	1/4W
R225	1-249-432-11	CARBON	18K	5%	1/4W
R226	1-249-427-11	CARBON	6.8K	5%	1/4W
R227	1-249-441-11	CARBON	100K	5%	1/4W
R228	1-249-429-11	CARBON	10K	5%	1/4W
R501	1-249-429-11	CARBON	10K	5%	1/4W
R502	1-249-429-11	CARBON	10K	5%	1/4W
		< VARIABLE RESISTOR >			
RV201	1-238-021-11	RES, ADJ, CARBON 220K			
		< TRANSFORMER >			
T201	1-433-330-11	TRANSFORMER, BIAS OSCILLATION			

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* A-6754-076-A CT-32 BOARD, COMPLETE

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(Ref. No 3,000 Series)

		< BUZZER >			
BZ901	1-529-070-11	BUZZER			
		< CAPACITOR >			
C300	1-124-126-00	ELECT	47uF	20%	10V
C301	1-164-098-11	CERAMIC	0.047uF		12V
C302	1-162-849-11	CERAMIC	0.068uF	10%	16V
C303	1-161-039-00	CERAMIC	0.001uF	10%	50V
C304	1-162-849-11	CERAMIC	0.068uF	10%	16V
C305	1-126-233-11	ELECT	22uF	20%	50V
C306	1-126-233-11	ELECT	22uF	20%	50V
C307	1-124-126-00	ELECT	47uF	20%	10V
C308	1-161-772-11	CERAMIC	0.1uF	10%	25V
C309	1-164-080-11	CERAMIC	390PF	10%	50V
C310	1-126-233-11	ELECT	22uF	20%	50V
C311	1-161-055-00	CERAMIC	0.022uF	10%	50V
C551	1-161-772-11	CERAMIC	0.1uF	10%	25V
C552	1-124-126-00	ELECT	47uF	20%	10V
C553	1-102-963-00	CERAMIC	33PF	5%	50V
C554	1-102-963-00	CERAMIC	33PF	5%	50V
C651	1-161-051-00	CERAMIC	0.01uF	10%	50V
C652	1-102-978-00	CERAMIC	220PF	5%	50V
C653	1-161-047-00	CERAMIC	0.0047uF	10%	50V
C654	1-161-039-00	CERAMIC	0.001uF	10%	50V
C655	1-124-903-11	ELECT	1uF	20%	50V
C685	1-126-154-11	ELECT	47uF	20%	6.3V
C686	1-161-772-11	CERAMIC	0.1uF	10%	25V
C687	1-102-980-00	CERAMIC	270PF	5%	50V
C688	1-102-980-00	CERAMIC	270PF	5%	50V
C689	1-102-122-00	CERAMIC	0.0027uF	10%	50V
C690	1-164-097-11	CERAMIC	0.022uF		50V
C691	1-124-903-11	ELECT	1uF	20%	50V
C692	1-161-772-11	CERAMIC	0.1uF	10%	25V
C693	1-164-082-11	CERAMIC	560PF	10%	50V
C901	1-162-851-11	CERAMIC	0.1uF	10%	16V
		< CONNECTOR >			
CN300	1-506-468-11	CONNECTOR 3P, MALE			
CN551	1-506-477-11	CONNECTOR 12P, MALE			
CN552	1-506-470-11	CONNECTOR 5P, MALE			
CN553	1-506-472-11	CONNECTOR 7P, MALE			
		< DIODE >			
D300	8-719-911-19	DIODE 1SS119			
D301	8-719-911-19	DIODE 1SS119			
D302	8-719-911-19	DIODE 1SS119			
D303	8-719-911-19	DIODE 1SS119			
D504	8-719-911-19	DIODE 1SS119			
D551	8-719-109-97	DIODE RD6.8ES-B2			
D651	8-719-911-19	DIODE 1SS119			
		< IC >			
IC301	8-759-242-56	IC TA8731P			
IC551	8-759-822-65	IC LC6543H-4374			
IC685	8-759-996-03	IC LVA519S			
		< COIL >			
L551	1-408-409-00	INDUCTOR 10uH			
L552	1-408-413-00	INDUCTOR 22uH			
		< TRANSISTOR >			
Q300	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q301	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q302	8-729-900-89	TRANSISTOR DTC144ES			
Q303	8-729-900-89	TRANSISTOR DTC144ES			
Q304	8-729-900-89	TRANSISTOR DTC144ES			
Q651	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q652	8-729-900-89	TRANSISTOR DTC144ES			
Q921	8-729-900-61	TRANSISTOR DTA114ES			
		< RESISTOR >			
R300	1-249-411-11	CARBON	330	5%	1/4W
R301	1-249-425-11	CARBON	4.7K	5%	1/4W
R302	1-249-426-11	CARBON	5.6K	5%	1/4W
R303	1-249-435-11	CARBON	33K	5%	1/4W
R304	1-249-439-11	CARBON	68K	5%	1/4W

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Ref. No.	Part No.	Description			Remark
R305	1-249-429-11	CARBON	10K	5%	1/4W
R306	1-249-411-11	CARBON	330	5%	1/4W
R307	1-247-891-00	CARBON	330K	5%	1/4W
R308	1-249-411-11	CARBON	330	5%	1/4W
R309	1-249-434-11	CARBON	27K	5%	1/4W
R310	1-249-426-11	CARBON	5.6K	5%	1/4W
R311	1-249-429-11	CARBON	10K	5%	1/4W
R312	1-249-437-11	CARBON	47K	5%	1/4W
R313	1-249-433-11	CARBON	22K	5%	1/4W
R314	1-249-429-11	CARBON	10K	5%	1/4W
R315	1-247-901-11	CARBON	820K	5%	1/4W
R316	1-247-903-00	CARBON	1M	5%	1/4W
R317	1-249-429-11	CARBON	10K	5%	1/4W
R319	1-249-429-11	CARBON	10K	5%	1/4W
R320	1-249-437-11	CARBON	47K	5%	1/4W
R321	1-249-433-11	CARBON	22K	5%	1/4W
R553	1-249-425-11	CARBON	4.7K	5%	1/4W
R554	1-249-417-11	CARBON	1K	5%	1/4W
R555	1-249-413-11	CARBON	470	5%	1/4W
R556	1-249-425-11	CARBON	4.7K	5%	1/4W
R651	1-249-419-11	CARBON	1.5K	5%	1/4W
R652	1-249-429-11	CARBON	10K	5%	1/4W
R653	1-247-903-00	CARBON	1M	5%	1/4W
R654	1-249-421-11	CARBON	2.2K	5%	1/4W
R655	1-249-422-11	CARBON	2.7K	5%	1/4W
R656	1-249-429-11	CARBON	10K	5%	1/4W
R685	1-249-429-11	CARBON	10K	5%	1/4W
R686	1-249-429-11	CARBON	10K	5%	1/4W
R687	1-249-422-11	CARBON	2.7K	5%	1/4W
R688	1-249-434-11	CARBON	27K	5%	1/4W
R689	1-249-429-11	CARBON	10K	5%	1/4W
R690	1-247-903-00	CARBON	1M	5%	1/4W
R691	1-249-414-11	CARBON	560	5%	1/4W
R924	1-249-417-11	CARBON	1K	5%	1/4W
R926	1-249-429-11	CARBON	10K	5%	1/4W

< VARIABLE RESISTOR >

RV685	1-238-015-11	RES, ADJ, CARBON 4.7K

< CRYSTAL >

X551	1-567-192-11	OSCILLATOR, CERAMIC (4MHz)

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Ref. No.	Part No.	Description	Remark
*	A-6755-336-A	MA-44 BOARD, COMPLETE	
		**********	
		(Ref. No 3,000 Series)	
	1-555-110-00	CABLE, PIN	
*	3-738-015-01	COVER, (DIA. 6) CARBON VR	
*	4-924-098-91	HOLDER, PC BOARD	

< CAPACITOR >

C001	1-164-159-11	CERAMIC	0.1uF		50V
C002	1-124-589-11	ELECT	47uF	20%	16V
C005	1-124-242-00	ELECT	33uF	20%	25V
C006	1-161-494-00	CERAMIC	0.022uF		25V
C007	1-124-234-00	ELECT	22uF	20%	16V
C008	1-164-096-11	CERAMIC	0.01uF		50V
C009	1-164-159-11	CERAMIC	0.1uF		50V
C010	1-161-327-00	CERAMIC	0.0033uF	30%	16V
C011	1-164-098-11	CERAMIC	0.047uF		12V
C013	1-164-159-11	CERAMIC	0.1uF		50V
C014	1-161-379-00	CERAMIC	0.01uF	20%	25V
C015	1-161-057-00	CERAMIC	0.033uF	10%	50V
C016	1-164-081-11	CERAMIC	470PF	10%	50V
C018	1-161-379-00	CERAMIC	0.01uF	20%	25V
C019	1-161-379-00	CERAMIC	0.01uF	20%	25V
C020	1-124-034-51	ELECT	33uF	20%	16V
C021	1-164-159-11	CERAMIC	0.1uF		50V
C101	1-124-925-11	ELECT	2.2uF	20%	100V
C102	1-124-925-11	ELECT	2.2uF	20%	100V
C103	1-124-234-00	ELECT	22uF	20%	16V
C104	1-124-234-00	ELECT	22uF	20%	16V
C105	1-124-925-11	ELECT	2.2uF	20%	100V
C106	1-124-234-00	ELECT	22uF	20%	16V
C107	1-124-925-11	ELECT	2.2uF	20%	100V
C108	1-124-257-00	ELECT	2.2uF	20%	50V
C110	1-124-234-00	ELECT	22uF	20%	16V
C111	1-124-234-00	ELECT	22uF	20%	16V
C112	1-164-096-11	CERAMIC	0.01uF		50V
C113	1-161-772-11	CERAMIC	0.1uF	10%	25V
C114	1-126-101-11	ELECT	100uF	20%	16V

Ref. No.	Part No.	Description			Remark
C115	1-164-096-11	CERAMIC	0.01uF		50V
C116	1-124-234-00	ELECT	22uF	20%	16V
C151	1-124-472-11	ELECT	470uF	20%	10V
C152	1-124-443-00	ELECT	100uF	20%	10V
C153	1-124-477-11	ELECT	47uF	20%	25V
C187	1-102-978-00	CERAMIC	220PF	5%	50V
C188	1-124-903-11	ELECT	1uF	20%	50V
C189	1-162-286-31	CERAMIC	220PF	10%	50V
C401	1-136-161-00	MYLAR	0.047uF	10%	50V
C402	1-124-234-00	ELECT	22uF	20%	16V
C403	1-164-096-11	CERAMIC	0.01uF		50V
C404	1-124-925-11	ELECT	2.2uF	20%	100V
C405	1-126-157-11	ELECT	10uF	20%	16V
C406	1-124-234-00	ELECT	22uF	20%	16V
C407	1-136-153-00	FILM	0.01uF	5%	50V
C408	1-164-096-11	CERAMIC	0.01uF		50V
C409	1-126-096-11	ELECT	10uF	20%	35V
C431	1-161-051-00	CERAMIC	0.01uF	10%	50V
C432	1-102-963-00	CERAMIC	33PF	5%	50V
C433	1-162-290-31	CERAMIC	470PF	10%	50V
C434	1-102-976-00	CERAMIC	180PF	5%	50V
C435	1-161-379-00	CERAMIC	0.01uF	20%	25V
C436	1-161-772-11	CERAMIC	0.1uF	10%	25V
C437	1-124-234-00	ELECT	22uF	20%	16V
C438	1-164-159-11	CERAMIC	0.1uF		50V
C499	1-126-101-11	ELECT	100uF	20%	16V
C501	1-124-443-00	ELECT	100uF	20%	10V
C502	1-161-772-11	CERAMIC	0.1uF	10%	25V
C503	1-161-051-00	CERAMIC	0.01uF	10%	50V
C504	1-102-950-00	CERAMIC	13PF	5%	50V
C505	1-102-950-00	CERAMIC	13PF	5%	50V
C506	1-161-772-11	CERAMIC	0.1uF	10%	25V
C520	1-161-374-11	CERAMIC	0.0015uF	20%	50V
C531	1-124-478-11	ELECT	100uF	20%	25V
C602	1-102-961-00	CERAMIC	27PF	5%	50V
C603	1-124-126-00	ELECT	47uF	20%	10V
C605	1-124-477-11	ELECT	47uF	20%	25V
C606	1-126-096-11	ELECT	10uF	20%	35V
C607	1-124-126-00	ELECT	47uF	20%	10V
C608	1-161-021-11	CERAMIC	0.047uF	10%	25V
C609	1-161-021-11	CERAMIC	0.047uF	10%	25V
C610	1-164-096-11	CERAMIC	0.01uF		50V
C611	1-164-096-11	CERAMIC	0.01uF		50V
C612	1-164-096-11	CERAMIC	0.01uF		50V
C613	1-124-126-00	ELECT	47uF	20%	10V
C614	1-102-951-00	CERAMIC	15PF	5%	50V
C615	1-102-951-00	CERAMIC	15PF	5%	50V
C617	1-102-959-00	CERAMIC	22PF	5%	50V
C620	1-161-374-11	CERAMIC	0.0015uF	20%	50V

Ref. No.	Part No.	Description			Remark
C701	1-124-234-00	ELECT	22uF	20%	16V
C702	1-101-880-00	CERAMIC	47PF	5%	50V
C703	1-102-943-00	CERAMIC	6.0PF	+-0.5PF	50V
C704	1-126-163-11	ELECT	4.7uF	20%	50V
C705	1-164-096-11	CERAMIC	0.01uF		50V
C706	1-124-126-00	ELECT	47uF	20%	10V
C711	1-124-917-11	ELECT	33uF	20%	63V
C713	1-124-034-51	ELECT	33uF	20%	16V
C714	1-164-097-11	CERAMIC	0.022uF		50V
C715	1-164-097-11	CERAMIC	0.022uF		50V
C716	1-164-096-11	CERAMIC	0.01uF		50V
C717	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C718	1-161-055-00	CERAMIC	0.022uF	10%	50V
C724	1-124-464-11	ELECT	0.22uF	20%	50V
C726	1-164-096-11	CERAMIC	0.01uF		50V
C801	1-161-043-00	CERAMIC	0.0022uF	10%	50V
C802	1-161-039-00	CERAMIC	0.001uF	10%	50V
C803	1-162-294-31	CERAMIC	0.001uF	10%	50V
C911	1-124-925-11	ELECT	2.2uF	20%	100V
C999	1-164-159-11	CERAMIC	0.1uF		50V

< CONNECTOR >

CN001	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN002	1-569-338-11	CONNECTOR, BOARD TO BOARD 19P	
CN003	1-569-340-11	CONNECTOR, BOARD TO BOARD 11P	
CN004	1-569-340-11	CONNECTOR, BOARD TO BOARD 11P	
* CN005	1-506-744-11	PIN, CONNECTOR 15P	
* CN006	1-506-744-11	PIN, CONNECTOR 15P	
CN008	1-569-344-11	CONNECTOR, BOARD TO BOARD 19P	
CN009	1-569-344-11	CONNECTOR, BOARD TO BOARD 19P	
CN010	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P	

< JACK >

CNJ001	1-507-562-00	JACK (CONTROL S IN)
CNJ002	1-568-185-21	JACK, PIN 4P (VIDEO/AUDIO LINE IN/LINE OUT)

< DIODE >

D401	8-719-101-50	DIODE	RD5.1E-L2
D402	8-719-911-19	DIODE	1SS119
D403	8-719-911-19	DIODE	1SS119
D404	8-719-911-19	DIODE	1SS119
D410	8-719-109-97	DIODE	RD6.8ES-B2
D501	8-719-911-19	DIODE	1SS119
D502	8-719-911-19	DIODE	1SS119
D505	8-719-911-19	DIODE	1SS119
D506	8-719-911-19	DIODE	1SS119
D601	8-719-911-19	DIODE	1SS119

Ref. No.	Part No.	Description	Remark
D602	8-719-911-19	DIODE 1SS119	
D660	8-719-911-19	DIODE 1SS119	
D661	8-719-911-19	DIODE 1SS119	
D662	8-719-911-19	DIODE 1SS119	
D663	8-719-911-19	DIODE 1SS119	
D799	8-719-110-78	DIODE RD33ES-B2	
D911	8-719-911-19	DIODE 1SS119	
D912	8-719-911-19	DIODE 1SS119	
D913	8-719-200-82	DIODE 11ES2	
		< IC >	
IC101	8-759-000-48	IC uPD4052BC-A	
IC102	8-759-927-56	IC BA7021	
IC401	8-759-912-77	IC LM324N	
IC402	8-759-981-96	IC RC4560D	
⚠IC403	8-759-983-45	IC BA6238A	
IC501	8-752-832-48	IC CXP80116-846Q	
IC601	8-759-634-22	IC M50554-182SP	
IC702	8-759-044-02	IC CAT93C46P	
		< IF BLOCK >	
⚠IF701	1-464-756-31	IF BLOCK (IFF-450A)	
		< COIL >	
L151	1-408-409-00	INDUCTOR 10uH	
L431	1-408-413-00	INDUCTOR 22uH	
L432	1-408-409-00	INDUCTOR 10uH	
L501	1-408-409-00	INDUCTOR 10uH	
L602	1-408-412-00	INDUCTOR 18uH	
L603	1-408-421-00	INDUCTOR 100uH	
L604	1-408-421-00	INDUCTOR 100uH	
L605	1-408-414-00	INDUCTOR 27uH	
L606	1-408-414-00	INDUCTOR 27uH	
L700	1-408-425-00	INDUCTOR 220uH	
L702	1-408-425-00	INDUCTOR 220uH	
L706	1-408-409-00	INDUCTOR 10uH	
L711	1-410-312-11	INDUCTOR 0.22uH	
L712	1-408-409-00	INDUCTOR 10uH	
L713	1-410-509-11	INDUCTOR 10uH	
L714	1-410-509-11	INDUCTOR 10uH	
L715	1-410-509-11	INDUCTOR 10uH	
L716	1-410-501-11	INDUCTOR 2.2uH	
L720	1-410-312-11	INDUCTOR 0.22uH	
L850	1-410-509-11	INDUCTOR 10uH	
L851	1-410-509-11	INDUCTOR 10uH	
L852	1-410-500-11	INDUCTOR 1.8uH	
L853	1-410-500-11	INDUCTOR 1.8uH	

Ref. No.	Part No.	Description	Remark
		< TRANSISTOR >	
Q151	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q401	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q403	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q404	8-729-900-89	TRANSISTOR DTC144ES	
Q405	8-729-900-63	TRANSISTOR DTA124ES	
Q408	8-729-601-47	TRANSISTOR 2SK381-B	
Q409	8-729-601-47	TRANSISTOR 2SK381-B	
Q431	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q432	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q433	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q434	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q501	8-729-900-89	TRANSISTOR DTC144ES	
Q603	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q604	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q605	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q709	8-729-140-96	TRANSISTOR 2SD774-34	
Q712	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q713	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q911	8-729-900-65	TRANSISTOR DTA144ES	
Q912	8-729-900-89	TRANSISTOR DTC144ES	
		< RESISTOR >	
R001	1-249-417-11	CARBON 1K 5% 1/4W	
R002	1-249-417-11	CARBON 1K 5% 1/4W	
R101	1-249-437-11	CARBON 47K 5% 1/4W	
R102	1-249-441-11	CARBON 100K 5% 1/4W	
R103	1-249-437-11	CARBON 47K 5% 1/4W	
R105	1-249-441-11	CARBON 100K 5% 1/4W	
R108	1-249-437-11	CARBON 47K 5% 1/4W	
R110	1-249-441-11	CARBON 100K 5% 1/4W	
R112	1-249-417-11	CARBON 1K 5% 1/4W	
R113	1-249-417-11	CARBON 1K 5% 1/4W	
R123	1-249-417-11	CARBON 1K 5% 1/4W	
R151	1-249-406-11	CARBON 120 5% 1/4W	
R152	1-249-406-11	CARBON 120 5% 1/4W	
R153	1-249-403-11	CARBON 68 5% 1/4W	
R161	1-249-405-11	CARBON 100 5% 1/4W	
R181	1-249-422-11	CARBON 2.7K 5% 1/4W	
R182	1-249-404-00	CARBON 82 5% 1/4W	
R188	1-249-417-11	CARBON 1K 5% 1/4W	
R189	1-249-417-11	CARBON 1K 5% 1/4W	
R401	1-249-432-11	CARBON 18K 5% 1/4W	
R402	1-249-431-11	CARBON 15K 5% 1/4W	
R403	1-249-417-11	CARBON 1K 5% 1/4W	
R404	1-249-436-11	CARBON 39K 5% 1/4W	
R405	1-249-433-11	CARBON 22K 5% 1/4W	
R406	1-249-429-11	CARBON 10K 5% 1/4W	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
R407	1-249-427-11	CARBON	6.8K	5%	1/4W
R408	1-249-417-11	CARBON	1K	5%	1/4W
R410	1-249-429-11	CARBON	10K	5%	1/4W
R411	1-249-429-11	CARBON	10K	5%	1/4W
R412	1-247-885-00	CARBON	180K	5%	1/4W
R413	1-249-429-11	CARBON	10K	5%	1/4W
R414	1-249-430-11	CARBON	12K	5%	1/4W
R415	1-249-417-11	CARBON	1K	5%	1/4W
R416	1-247-889-00	CARBON	270K	5%	1/4W
R417	1-249-426-11	CARBON	5.6K	5%	1/4W
R420	1-249-423-11	CARBON	3.3K	5%	1/4W
R421	1-249-421-11	CARBON	2.2K	5%	1/4W
R422	1-249-423-11	CARBON	3.3K	5%	1/4W
R423	1-249-417-11	CARBON	1K	5%	1/4W
R424	1-247-885-00	CARBON	180K	5%	1/4W
R425	1-249-441-11	CARBON	100K	5%	1/4W
R427	1-249-429-11	CARBON	10K	5%	1/4W
R428	1-249-427-11	CARBON	6.8K	5%	1/4W
R429	1-249-425-11	CARBON	4.7K	5%	1/4W
R431	1-249-430-11	CARBON	12K	5%	1/4W
R432	1-249-431-11	CARBON	15K	5%	1/4W
R433	1-249-417-11	CARBON	1K	5%	1/4W
R434	1-249-417-11	CARBON	1K	5%	1/4W
R435	1-249-418-11	CARBON	1.2K	5%	1/4W
R436	1-249-417-11	CARBON	1K	5%	1/4W
R437	1-247-897-11	CARBON	560K	5%	1/4W
R438	1-249-421-11	CARBON	2.2K	5%	1/4W
R439	1-249-421-11	CARBON	2.2K	5%	1/4W
R440	1-249-428-11	CARBON	8.2K	5%	1/4W
R441	1-249-402-11	CARBON	56	5%	1/4W
R442	1-249-413-11	CARBON	470	5%	1/4W
R443	1-249-427-11	CARBON	6.8K	5%	1/4W
R444	1-249-437-11	CARBON	47K	5%	1/4W
R445	1-249-435-11	CARBON	33K	5%	1/4W
R446	1-249-429-11	CARBON	10K	5%	1/4W
R450	1-249-441-11	CARBON	100K	5%	1/4W
R451	1-249-441-11	CARBON	100K	5%	1/4W
R497	1-249-409-11	CARBON	220	5%	1/4W
R499	1-249-413-11	CARBON	470	5%	1/4W
R503	1-249-429-11	CARBON	10K	5%	1/4W
R504	1-249-429-11	CARBON	10K	5%	1/4W
R505	1-249-417-11	CARBON	1K	5%	1/4W
R506	1-249-435-11	CARBON	33K	5%	1/4W
R507	1-249-428-11	CARBON	8.2K	5%	1/4W
R515	1-249-417-11	CARBON	1K	5%	1/4W
R516	1-249-417-11	CARBON	1K	5%	1/4W
R519	1-249-429-11	CARBON	10K	5%	1/4W
R531	1-249-417-11	CARBON	1K	5%	1/4W
⚠R533	1-247-744-11	CARBON	270	5%	1/2W F

Ref. No.	Part No.	Description			Remark
R534	1-249-433-11	CARBON	22K	5%	1/4W
R535	1-249-433-11	CARBON	22K	5%	1/4W
R536	1-249-433-11	CARBON	22K	5%	1/4W
R537	1-249-433-11	CARBON	22K	5%	1/4W
R538	1-249-433-11	CARBON	22K	5%	1/4W
R539	1-249-433-11	CARBON	22K	5%	1/4W
R599	1-249-429-11	CARBON	10K	5%	1/4W
R601	1-249-441-11	CARBON	100K	5%	1/4W
R602	1-249-429-11	CARBON	10K	5%	1/4W
R603	1-249-429-11	CARBON	10K	5%	1/4W
R604	1-249-431-11	CARBON	15K	5%	1/4W
R605	1-249-431-11	CARBON	15K	5%	1/4W
R606	1-249-435-11	CARBON	33K	5%	1/4W
R607	1-249-409-11	CARBON	220	5%	1/4W
R608	1-249-430-11	CARBON	12K	5%	1/4W
R609	1-249-425-11	CARBON	4.7K	5%	1/4W
R610	1-249-403-11	CARBON	68	5%	1/4W
R611	1-249-429-11	CARBON	10K	5%	1/4W
R613	1-249-421-11	CARBON	2.2K	5%	1/4W
R614	1-249-405-11	CARBON	100	5%	1/4W
R615	1-249-435-11	CARBON	33K	5%	1/4W
R616	1-249-425-11	CARBON	4.7K	5%	1/4W
R617	1-249-423-11	CARBON	3.3K	5%	1/4W
R618	1-249-413-11	CARBON	470	5%	1/4W
R619	1-249-413-11	CARBON	470	5%	1/4W
R620	1-249-414-11	CARBON	560	5%	1/4W
R621	1-249-405-11	CARBON	100	5%	1/4W
R622	1-249-414-11	CARBON	560	5%	1/4W
R623	1-249-420-11	CARBON	1.8K	5%	1/4W
R624	1-249-422-11	CARBON	2.7K	5%	1/4W
R625	1-249-421-11	CARBON	2.2K	5%	1/4W
R629	1-249-405-11	CARBON	100	5%	1/4W
R630	1-249-422-11	CARBON	2.7K	5%	1/4W
R631	1-249-423-11	CARBON	3.3K	5%	1/4W
R632	1-249-414-11	CARBON	560	5%	1/4W
R633	1-249-415-11	CARBON	680	5%	1/4W
R634	1-249-422-11	CARBON	2.7K	5%	1/4W
R635	1-249-424-11	CARBON	3.9K	5%	1/4W
R692	1-249-421-11	CARBON	2.2K	5%	1/4W
R693	1-249-421-11	CARBON	2.2K	5%	1/4W
R694	1-249-417-11	CARBON	1K	5%	1/4W
R695	1-249-425-11	CARBON	4.7K	5%	1/4W
R696	1-249-423-11	CARBON	3.3K	5%	1/4W
R697	1-249-441-11	CARBON	100K	5%	1/4W
R701	1-249-435-11	CARBON	33K	5%	1/4W
R709	1-249-419-11	CARBON	1.5K	5%	1/4W
R712	1-249-417-11	CARBON	1K	5%	1/4W
R713	1-249-417-11	CARBON	1K	5%	1/4W

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
R715	1-249-429-11	CARBON	10K	5%	1/4W
R716	1-249-429-11	CARBON	10K	5%	1/4W
R717	1-247-887-00	CARBON	220K	5%	1/4W
R718	1-249-424-11	CARBON	3.9K	5%	1/4W
R719	1-249-429-11	CARBON	10K	5%	1/4W
R720	1-249-423-11	CARBON	3.3K	5%	1/4W
R724	1-249-417-11	CARBON	1K	5%	1/4W
R730	1-249-417-11	CARBON	1K	5%	1/4W
R733	1-249-405-11	CARBON	100	5%	1/4W
R734	1-249-417-11	CARBON	1K	5%	1/4W
R735	1-249-417-11	CARBON	1K	5%	1/4W
R736	1-249-417-11	CARBON	1K	5%	1/4W
R737	1-249-417-11	CARBON	1K	5%	1/4W
R738	1-249-435-11	CARBON	33K	5%	1/4W
R739	1-249-429-11	CARBON	10K	5%	1/4W
R751	1-249-433-11	CARBON	22K	5%	1/4W
R807	1-249-417-11	CARBON	1K	5%	1/4W
R808	1-249-417-11	CARBON	1K	5%	1/4W
R809	1-249-417-11	CARBON	1K	5%	1/4W
R810	1-249-417-11	CARBON	1K	5%	1/4W
R850	1-249-417-11	CARBON	1K	5%	1/4W
R911	1-249-421-11	CARBON	2.2K	5%	1/4W
R999	1-249-417-11	CARBON	1K	5%	1/4W
		< MODULATOR >			
⚠RFU701	1-466-150-11	MODULATOR, RF (RFU-1025)			
		< VARIABLE RESISTOR >			
RV501	1-238-019-11	RES, ADJ, CARBON 47K			
		< COIL >			
T701	1-409-418-11	COIL			
		< TUNER >			
⚠TU701	1-465-371-11	TUNER, ET (BTP-RA401)			
		< VIBRATOR >			
X501	1-577-383-11	VIBRATOR, CRYSTAL (16MHz)			
X601	1-577-381-11	VIBRATOR, CRYSTAL (14.3MHz)			

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Ref. No.	Part No.	Description			Remark
	A-6754-278-A	MD-49 BOARD, COMPLETE			
		**********			
		(Ref. No 4,000 Series)			
	1-691-643-11	CONNECTOR, BOARD TO BOARD			
*	2-387-601-01	CUSHION, RUBBER			
		< CAPACITOR >			
C001	1-161-494-00	CERAMIC	0.022uF		25V
C002	1-161-494-00	CERAMIC	0.022uF		25V
C003	1-126-157-11	ELECT	10uF	20%	16V
C004	1-161-379-00	CERAMIC	0.01uF	20%	25V
C005	1-126-157-11	ELECT	10uF	20%	16V
C006	1-124-589-11	ELECT	47uF	20%	16V
C008	1-164-159-11	CERAMIC	0.1uF		50V
C009	1-164-159-11	CERAMIC	0.1uF		50V
C011	1-162-849-11	CERAMIC	0.068uF	10%	16V
C012	1-162-849-11	CERAMIC	0.068uF	10%	16V
C013	1-162-849-11	CERAMIC	0.068uF	10%	16V
C014	1-126-160-11	ELECT	1uF	20%	50V
C016	1-124-589-11	ELECT	47uF	20%	16V
C017	1-126-162-11	ELECT	3.3uF	20%	50V
C018	1-124-589-11	ELECT	47uF	20%	16V
C019	1-124-589-11	ELECT	47uF	20%	16V
C020	1-164-159-11	CERAMIC	0.1uF		50V
C021	1-162-292-31	CERAMIC	680PF	10%	50V
C027	1-162-294-31	CERAMIC	0.001uF	10%	50V
C028	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< CONNECTOR >			
CN001	1-506-494-11	PIN, CONNECTOR 15P			
CN002	1-569-335-11	CONNECTOR, BOARD TO BOARD 9P			
CN004	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
CN005	1-506-482-11	CONNECTOR 3P, MALE			
CN006	1-569-333-11	CONNECTOR, BOARD TO BOARD 3P			
CN007	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
		< DIODE >			
D001	8-719-985-00	DIODE GL451VS1			
D004	8-719-109-93	DIODE RD6.2ES-B2			
D005	8-719-109-93	DIODE RD6.2ES-B2			
D006	8-719-109-93	DIODE RD6.2ES-B2			
D007	8-719-109-93	DIODE RD6.2ES-B2			
		< IC >			
IC002	8-759-938-12	IC BA10324			
⚠IC004	8-759-234-03	IC TA8424F			

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
		< PHOTO INTERUPTER >			
PH001	8-759-144-33	IC PS6002			
PH002	8-759-144-33	IC PS6002			
		< IC LINK >			
⚠ PS001	1-532-685-00	LINK, IC ICP-N20 0.8A			
		< TRANSISTOR >			
Q001	8-729-926-31	TRANSISTOR PT483F1S			
Q002	8-729-926-31	TRANSISTOR PT483F1S			
		< RESISTOR >			
R001	1-249-423-11	CARBON	3.3K	5% 1/4W	
R002	1-249-423-11	CARBON	3.3K	5% 1/4W	
R003	1-249-426-11	CARBON	5.6K	5% 1/4W	
R004	1-249-426-11	CARBON	5.6K	5% 1/4W	
R005	1-249-417-11	CARBON	1K	5% 1/4W	
R006	1-249-441-11	CARBON	100K	5% 1/4W	
R007	1-249-441-11	CARBON	100K	5% 1/4W	
R008	1-249-425-11	CARBON	4.7K	5% 1/4W	
R009	1-249-409-11	CARBON	220	5% 1/4W	
R010	1-249-425-11	CARBON	4.7K	5% 1/4W	
R011	1-249-437-11	CARBON	47K	5% 1/4W	
R012	1-249-421-11	CARBON	2.2K	5% 1/4W	
R013	1-249-429-11	CARBON	10K	5% 1/4W	
R014	1-249-426-11	CARBON	5.6K	5% 1/4W	
R015	1-249-437-11	CARBON	47K	5% 1/4W	
R016	1-249-421-11	CARBON	2.2K	5% 1/4W	
⚠ R019	1-249-377-11	CARBON	0.47	5% 1/4W F	
R020	1-249-406-11	CARBON	120	5% 1/4W	
R021	1-249-383-11	CARBON	1.5	5% 1/6W	
R022	1-249-408-11	CARBON	180	5% 1/4W	
R024	1-249-417-11	CARBON	1K	5% 1/4W	
R025	1-247-891-00	CARBON	330K	5% 1/4W	
R027	1-249-383-11	CARBON	1.5	5% 1/6W	
R028	1-249-383-11	CARBON	1.5	5% 1/6W	
		< SWITCH >			
S001	1-570-953-11	SWITCH, PUSH (1 KEY) (CASSETTE UP/DOWN)			
S002	1-570-953-11	SWITCH, PUSH (1 KEY) (REC PROOF)			

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Ref. No.	Part No.	Description			Remark
*	A-6721-445-A	MF-149 BOARD, COMPLETE			
		**********			
		(Ref. No 6,000 Series)			
	1-572-662-11	SWITCH, ROTARY (DUAL MODE SHUTTLE)			
*	3-744-220-01	HOLDER, FL			
		< CAPACITOR >			
C002	1-164-056-11	CERAMIC	27PF	5% 50V	
C003	1-164-024-11	CERAMIC	16PF	5% 50V	
C004	1-164-159-11	CERAMIC	0.1uF	50V	
C005	1-164-159-11	CERAMIC	0.1uF	50V	
C006	1-125-486-11	DOUBLE LAYERS	0.22F	5.5V	
C007	1-164-159-11	CERAMIC	0.1uF	50V	
C008	1-126-096-11	ELECT	10uF	20% 35V	
C009	1-164-159-11	CERAMIC	0.1uF	50V	
C010	1-128-057-11	ELECT	330uF	20% 6.3V	
		< VIBRATOR >			
CF001	1-577-101-11	VIBRATOR, CERAMIC (4.19MHz)			
		< CONNECTOR >			
CN001	1-569-342-11	CONNECTOR, BOARD TO BOARD 19P			
CN002	1-569-342-11	CONNECTOR, BOARD TO BOARD 19P			
CN003	1-562-631-11	SOCKET, CONNECTOR 4P			
CN004	1-580-850-11	CONNECTOR (DMS) 8P			
CN005	1-568-673-11	CONNECTOR, BOARD TO BOARD 14P			
		< DIODE >			
D001	8-719-974-59	DIODE 1SR139-100			
D002	8-719-974-59	DIODE 1SR139-100			
D004	8-719-110-08	DIODE RD8.2ES-B2			
D005	8-719-109-97	DIODE RD6.8ES-B2			
D006	8-719-109-97	DIODE RD6.8ES-B2			
D007	8-719-109-97	DIODE RD6.8ES-B2			
D008	8-719-109-97	DIODE RD6.8ES-B2			
D009	8-719-911-19	DIODE 1SS119			
		< INDICATOR TUBE >			
FL001	1-519-580-11	INDICATOR TUBE, FLUORESENT			
		< IC >			
IC001	8-752-834-75	IC CXP50116-269Q			
IC002	8-759-995-76	IC PST529C			
IC003	8-759-971-15	IC PST529H			
		< COIL >			
L001	1-410-509-11	INDUCTOR 10uH			

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

MF-149 MF-150 POWER BLOCK

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R001	1-249-433-11	CARBON	22K	5% 1/4W	
R002	1-247-895-00	CARBON	470K	5% 1/4W	
R004	1-249-423-11	CARBON	3.3K	5% 1/4W	
R005	1-249-423-11	CARBON	3.3K	5% 1/4W	
R006	1-249-423-11	CARBON	3.3K	5% 1/4W	
R009	1-249-419-11	CARBON	1.5K	5% 1/4W	
R010	1-249-417-11	CARBON	1K	5% 1/4W	
R011	1-249-419-11	CARBON	1.5K	5% 1/4W	
R012	1-249-420-11	CARBON	1.8K	5% 1/4W	
R015	1-249-425-11	CARBON	4.7K	5% 1/4W	
R016	1-249-425-11	CARBON	4.7K	5% 1/4W	
R017	1-249-425-11	CARBON	4.7K	5% 1/4W	
R018	1-249-425-11	CARBON	4.7K	5% 1/4W	
R019	1-249-425-11	CARBON	4.7K	5% 1/4W	
R020	1-249-425-11	CARBON	4.7K	5% 1/4W	
R021	1-249-425-11	CARBON	4.7K	5% 1/4W	
R022	1-249-425-11	CARBON	4.7K	5% 1/4W	
R023	1-249-417-11	CARBON	1K	5% 1/4W	
R024	1-249-417-11	CARBON	1K	5% 1/4W	
R025	1-249-417-11	CARBON	1K	5% 1/4W	
R031	1-249-420-11	CARBON	1.8K	5% 1/4W	
R032	1-249-404-00	CARBON	82	5% 1/4W	
R033	1-247-887-00	CARBON	220K	5% 1/4W	
		< SWITCH >			
S001	1-571-977-11	SWITCH, TACTIL (PAUSE)			
S002	1-571-977-11	SWITCH, TACTIL (HI-SPEED REWIND)			
		< VIBLATOR >			
X001	1-579-435-11	VIBLATOR, CRYSTAL (32.768KHz)			
**********					
*	A-6756-335-A	MF-150 BOARD, COMPLETE			
		**********			
		(Ref. No 6,000 Series)			
		< CAPACITOR >			
C064	1-162-294-31	CERAMIC	0.001uF	10% 50V	
		< CONNECTOR >			
CN060	1-568-667-11	CONNECTOR, BOARD TO BOARD 14P			
		< JACK >			
CNJ061	1-569-444-11	JACK, PIN 2P (LINE IN 2 VIDEO/AUDIO)			

Ref. No.	Part No.	Description			Remark
		< DIODE >			
D061	8-719-303-02	DIODE SEL2510C-D			
D062	8-719-303-02	DIODE SEL2510C-D			
D064	8-719-911-19	DIODE 1SS119			
D065	8-719-911-19	DIODE 1SS119			
D066	8-719-109-97	DIODE RD6.8ES-B2			
		< IC >			
IC061	1-466-131-21	IC GP1U52X			
		< RESISTOR >			
R061	1-249-437-11	CARBON	47K	5% 1/4W	
R062	1-249-423-11	CARBON	3.3K	5% 1/4W	
R063	1-249-407-11	CARBON	150	5% 1/4W	
R064	1-249-407-11	CARBON	150	5% 1/4W	
R065	1-249-427-11	CARBON	6.8K	5% 1/4W	
R067	1-249-404-00	CARBON	82	5% 1/4W	
R068	1-249-422-11	CARBON	2.7K	5% 1/4W	
R069	1-249-428-11	CARBON	8.2K	5% 1/4W	
R070	1-249-417-11	CARBON	1K	5% 1/4W	
R071	1-249-428-11	CARBON	8.2K	5% 1/4W	
R072	1-249-417-11	CARBON	1K	5% 1/4W	
		< VARIABLE RESISTOR >			
RV061	1-241-209-11	RES, VAR, CARBON 10K (SHARPNESS SOFT/SHARP)			
		< SWITCH >			
S061	1-571-977-11	SWITCH, TACTIL (POWER ON/OFF)			
S062	1-571-977-11	SWITCH, TACTIL (EJECT)			
S063	1-570-854-11	SWITCH, SLIDE (COMMAND MODE VTR1/2/3)			
S064	1-571-977-11	SWITCH, TACTIL (CL)			
**********					
⚠	1-413-559-11	POWER BLOCK (PX model)			
		**********			
		(Ref. No 8,000 Series)			
Not supplied parts other than as follows.					
		< CAPACITOR >			
⚠C101	1-136-185-00	FILM	0.22uF	20% 250V	
⚠C102	1-161-742-00	CERAMIC	2200PF	20% 400V	
⚠C103	1-161-742-00	CERAMIC	2200PF	20% 400V	
⚠C104-1	1-162-599-12	CERAMIC	4700PF	20% 400V	
⚠C104-3	1-162-599-12	CERAMIC	4700PF	20% 400V	
C106	1-136-207-11	FILM	0.047uF	5% 630V	
C107	1-162-558-11	CERAMIC	100PF	10% 2KV	
C108	1-124-634-11	ELECT	1uF	20% 250V	
C109	1-130-487-00	FILM	0.022uF	5% 50V	
C111	1-130-491-00	FILM	0.047uF	5% 50V	

Note:
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Replace only with part number specified.

Note:
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Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
⚠C115	1-136-209-11	FILM	0.1uF	5%	250V
⚠C116-2	1-161-742-00	CERAMIC	2200PF	20%	400V
C201	1-124-120-11	ELECT	220uF	20%	16V
C202	9-998-877-01	ELECT	1500uF	20%	25V
C203	1-126-541-11	ELECT	330uF	20%	25V
C205	1-124-120-11	ELECT	220uF	20%	16V
C206	1-126-103-11	ELECT	470uF	20%	16V
C207	1-126-335-11	ELECT	220uF	20%	10V
C208	1-124-757-51	ELECT	3300uF	20%	10V
C209	1-124-572-11	ELECT	100uF	20%	63V
C210	1-124-757-51	ELECT	100uF	20%	50V
C211	1-124-559-51	ELECT	1000uF	20%	10V
C212	1-130-483-00	FILM	0.01uF	5%	50V
C213	1-130-483-00	FILM	0.01uF	5%	50V
C214	1-130-774-00	FILM	0.33uF	5%	63V
C215	1-124-910-11	ELECT	47uF	20%	50V
C216	1-123-379-00	ELECT	0.47uF	20%	100V
C217	1-130-471-00	FILM	1000PF	5%	50V
C218	1-164-143-11	FILM	1000PF	10%	1KV
C219	1-106-351-00	FILM	2200PF	10%	100V
C220	1-130-483-00	FILM	0.01uF	5%	50V
C221	1-130-487-00	FILM	0.022uF	5%	50V
		< CONNECTOR >			
⚠CN101	1-540-054-11	INLET, AC			
CN711	1-569-341-11	CONNECTOR, BOARD TO BOARD 19P			
		< DIODE >			
⚠D101	8-719-510-06	DIODE	S1WB60		
D102	8-719-913-44	DIODE	ERA82-004		
D103	8-719-913-44	DIODE	ERA82-004		
D104-1	9-998-285-01	DIODE	D1N60		
D104-2	9-998-285-01	DIODE	D1N60		
D105	9-998-285-01	DIODE	D1N60		
D201	9-994-171-01	DIODE	D4LA20		
D202	8-719-970-87	DIODE	ERA38-06		
D203	8-719-110-57	DIODE	RD22ES-B2		
D206	8-719-500-15	DIODE	S3S4M		
D207	8-719-951-30	DIODE	ERA91-02		
D208	8-719-980-78	DIODE	ERA83-006		
D209	8-719-160-67	DIODE	RD18FB1		
D211	8-719-109-97	DIODE	RD6.8ES-B2		
		< FUSE >			
⚠F101	1-532-203-00	FUSE, TIMER-LAG T2A 250V			
		< HIC >			
⚠HIC101	9-900-265-01	HIC MA2831			

Ref. No.	Part No.	Description			Remark
		< IC >			
⚠IC201	9-998-852-01	IC PQ12RF11			
IC202	8-759-420-19	IC AN1431T			
⚠IC203	8-759-400-67	IC AN7809			
IC205	8-759-420-19	IC AN1431T			
		< COIL >			
L201	1-421-915-11	CHOKE COIL 40uH			
L202	9-998-850-01	FERRITE BEAD			
		< PHOTE COUPLER >			
⚠PC101	8-719-939-00	PHOTE COUPLER PC111S			
		< IC LINK >			
⚠PS201	1-532-679-21	IC LINK ICPF15			
		< TRANSISTOR >			
Q201	8-729-422-65	TRANSISTOR	UN4119		
Q202	8-729-900-80	TRANSISTOR	DTC114ES		
Q203	8-729-900-61	TRANSISTOR	DTA114ES		
Q204	9-998-854-01	TRANSISTOR	2SD1789		
Q206	8-729-906-96	TRANSISTOR	2SD2061E		
Q207	8-729-907-43	TRANSISTOR	2SC1740S		
Q208	8-729-907-43	TRANSISTOR	2SC1740S		
		< RESISTOR >			
⚠R101	1-216-393-00	CEMENT	2.2	5%	3W
⚠R102-1	1-215-929-11	METAL	100K	5%	3W
⚠R102-2	1-215-929-11	METAL	100K	5%	3W
⚠R103-1	1-214-921-00	METAL	220K	1%	1/2W
R103-2	1-214-921-00	METAL	220K	1%	1/2W
R104-1	1-247-894-11	CARBON	430K	5%	1/4W
R104-2	1-247-894-11	CARBON	430K	5%	1/4W
⚠R105	1-214-852-00	METAL	330	1%	1/2W
⚠R106	1-212-978-11	FUSE	68	5%	1/2W
⚠R107	1-212-982-00	FUSE	100	5%	1/2W
R108-1	1-214-824-11	METAL	22	1%	1/2W
R108-2	1-214-824-11	METAL	22	1%	1/2W
R109	1-249-409-11	CARBON	220	5%	1/4W
⚠R201	1-212-966-00	FUSE	22	5%	1/2W
⚠R202-1	1-215-890-11	METAL	470	5%	2W
⚠R202-2	1-215-890-11	METAL	470	5%	2W
⚠R203	1-212-972-00	FUSE	39	5%	1/2W
⚠R204	1-212-944-00	FUSE	2.7	5%	1/2W
⚠R205	1-212-974-00	FUSE	47	5%	1/2W
R206	1-215-426-00	METAL	1.6K	1%	1/4W
⚠R207-1	1-215-425-00	METAL	1.5K	1%	1/4W

Note:
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Replace only with part number specified.

Note:
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Ne les remplacer que par une pièce portant le numéro spécifié.

POWER BLOCK RP-136

Ref. No.	Part No.	Description			Remark
R208	1-214-721-00	METAL	470	1%	1/4W
R209	1-249-413-11	CARBON	470	5%	1/4W
⚠R211	1-216-361-00	METAL	0.22	5%	2W
R212	1-214-707-00	METAL	120	1%	1/4W
R213	1-215-425-00	METAL	1.5K	1%	1/4W
R214	1-247-820-11	CARBON	360	5%	1/4W
R215	1-215-425-00	METAL	1.5K	1%	1/4W
⚠R216	1-216-458-11	METAL	1.8K	5%	2W
R218	1-249-415-11	CARBON	680	5%	1/4W
R219	1-249-417-11	CARBON	1K	5%	1/4W
R222	1-249-425-11	CARBON	4.7K	5%	1/4W
R231	1-249-419-11	CARBON	1.5K	5%	1/4W
R232	1-215-435-00	METAL	3.9K	1%	1/4W
R233	1-214-721-00	METAL	470	1%	1/4W
R234	1-215-441-00	METAL	6.8K	1%	1/4W
		< THERMISTOR >			
⚠THY201	8-719-107-80	THYRISTOR 03P5MG			

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⚠	1-413-540-11	POWER BLOCK (US, CND model)	
		**********	
		(Ref. No 7,000 Series)	

Not supplied parts other than as follows.

		< CAPACITOR >	
C105	1-125-499-11	ELECT	220uF 20% 200V
		< DIODE >	
⚠D101	8-719-510-06	DIODE	S1WB60
D105	9-998-285-01	DIODE	D1N60
D110	8-719-951-30	DIODE	ERA91-02
D201	9-994-171-01	DIODE	D4LA20
D202	8-719-951-30	DIODE	ERA91-02
D203	8-719-110-57	DIODE	RD22ES-B2
D206	8-719-500-15	DIODE	S3S4M
D207	8-719-951-30	DIODE	ERA91-02
D208	9-998-861-01	DIODE	ERA83-004
D209	8-719-160-68	DIODE	RD18FB2
D211	8-719-109-97	DIODE	RD6.8ES-B2
		< FUSE >	
⚠F101	1-532-742-11	FUSE, GLASS TUBE 1.6A 125V	
		< HIC >	
⚠HIC101	9-900-265-01	HIC MA2831	
		< IC >	
⚠IC201	8-759-604-39	IC M5F78M12L	
IC202	8-759-420-19	IC AN1431T	
⚠IC203	8-759-982-10	IC RC7809FA	
IC205	8-759-420-19	IC AN1431T	
		< PHOTE COUPLER >	
⚠PC101	8-719-902-56	PHOTE COUPLER PC817	
		< IC LINK >	
⚠PS201	1-532-679-21	IC LINK ICPF15	
		< TRANSISTOR >	
Q201	8-729-422-65	TRANSISTOR	UN4119
Q202	8-729-900-80	TRANSISTOR	DTC114ES
Q203	8-729-900-61	TRANSISTOR	DTA114ES
Q204	9-998-854-01	TRANSISTOR	2SD1789
Q206	8-729-209-15	TRANSISTOR	2SD2012
Q207	8-729-119-78	TRANSISTOR	2SC2785-HFE
Q208	8-729-119-78	TRANSISTOR	2SC2785-HFE
		< RESISTOR >	
⚠R203	1-212-972-00	FUSE 39	1/2W 5%
		< THYRISTOR >	
⚠THY201	8-719-107-80	THYRISTOR 03P5MG	

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*	A-6727-402-A	RP-136 BOARD, COMPLETE	
		**********	
		(Ref. No 1,000 Series)	
	3-682-057-11	SPACER (SMALL)	
*	3-741-956-11	CASE (MAIN), SHIELD, RP	
*	3-741-957-11	CASE (LID), SHIELD, RP	
*	3-741-958-11	CASE (BOTTOM), SHIELD, RP	
		< CAPACITOR >	
C803	1-164-159-11	CERAMIC	0.1uF 50V
C804	1-164-159-11	CERAMIC	0.1uF 50V
C805	1-164-159-11	CERAMIC	0.1uF 50V
C806	1-164-159-11	CERAMIC	0.1uF 50V
C807	1-164-159-11	CERAMIC	0.1uF 50V
C808	1-126-154-11	ELECT	47uF 20% 6.3V
C809	1-124-464-11	ELECT	0.22uF 20% 50V
C810	1-124-464-11	ELECT	0.22uF 20% 50V
C811	1-124-464-11	ELECT	0.22uF 20% 50V
C812	1-124-464-11	ELECT	0.22uF 20% 50V

Note:
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note:
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remark
C813	1-162-211-31	CERAMIC	33PF	5%	50V
C815	1-162-211-31	CERAMIC	33PF	5%	50V
C827	1-162-211-31	CERAMIC	33PF	5%	50V
C830	1-162-306-11	CERAMIC	0.01uF	20%	16V
C831	1-161-053-00	CERAMIC	0.015uF	10%	50V
C832	1-124-903-11	ELECT	1uF	20%	50V
C833	1-162-306-11	CERAMIC	0.01uF	20%	16V
C834	1-162-289-31	CERAMIC	390PF	10%	50V
C835	1-161-327-00	CERAMIC	0.0033uF	20%	16V
C836	1-126-154-11	ELECT	47uF	20%	6.3V
C837	1-164-159-11	CERAMIC	0.1uF		50V
C857	1-161-053-00	CERAMIC	0.015uF	10%	50V
C858	1-161-053-00	CERAMIC	0.015uF	10%	50V
C859	1-102-935-00	CERAMIC	2.0PF	+-0.25PF	50V
C861	1-161-053-00	CERAMIC	0.015uF	10%	50V
C864	1-164-159-11	CERAMIC	0.1uF		50V
C866	1-102-962-00	CERAMIC	30PF	5%	50V
C867	1-161-053-00	CERAMIC	0.015uF	10%	50V
C868	1-101-888-00	CERAMIC	68PF	5%	50V
C869	1-102-973-00	CERAMIC	100PF	5%	50V
C870	1-102-820-00	CERAMIC	330PF	5%	50V
C871	1-164-159-11	CERAMIC	0.1uF		50V
C872	1-126-154-11	ELECT	47uF	20%	6.3V
C873	1-164-159-11	CERAMIC	0.1uF		50V
C878	1-162-306-11	CERAMIC	0.01uF	20%	16V
		< CONNECTOR >			
CN801	1-563-585-11	CONNECTOR, FLEXIBLE 8P			
* CN804	1-564-031-00	PIN, CONNECTOR 6P			
CN805	1-569-337-11	CONNECTOR, BOARD TO BOARD 11P			
CN806	1-569-337-11	CONNECTOR, BOARD TO BOARD 11P			
		< DIODE >			
D806	8-719-911-19	DIODE 1SS119			
D808	8-719-911-19	DIODE 1SS119			
D809	8-719-911-19	DIODE 1SS119			
		< IC >			
IC802	8-759-320-52	IC HA118019NT			
		< COIL >			
L801	1-408-421-00	INDUCTOR 100uH			
L803	1-408-421-00	INDUCTOR 100uH			
L806	1-408-414-00	INDUCTOR 27uH			
L807	1-408-415-00	INDUCTOR 33uH			
L808	1-408-418-00	INDUCTOR 56uH			
L810	1-408-412-00	INDUCTOR 18uH			
L811	1-408-409-00	INDUCTOR 10uH			
L812	1-408-424-00	INDUCTOR 180uH			

Ref. No.	Part No.	Description			Remark
L813	1-408-421-00	INDUCTOR 100uH			
		< TRANSISTOR >			
Q805	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q809	8-729-119-76	TRANSISTOR	2SA1175-HFE		
Q811	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q812	8-729-900-89	TRANSISTOR	DTC144ES		
Q813	8-729-119-78	TRANSISTOR	2SC2785-HFE		
Q814	8-729-900-89	TRANSISTOR	DTC144ES		
Q815	8-729-900-89	TRANSISTOR	DTC144ES		
		< RESISTOR >			
R801	1-249-405-11	CARBON	100	5%	1/4W
R809	1-249-407-11	CARBON	150	5%	1/4W
R810	1-249-407-11	CARBON	150	5%	1/4W
R811	1-249-405-11	CARBON	100	5%	1/4W
R812	1-249-405-11	CARBON	100	5%	1/4W
R826	1-249-432-11	CARBON	18K	5%	1/4W
R827	1-249-433-11	CARBON	22K	5%	1/4W
R828	1-249-429-11	CARBON	10K	5%	1/4W
R829	1-249-429-11	CARBON	10K	5%	1/4W
R830	1-247-895-00	CARBON	470K	5%	1/4W
R831	1-249-420-11	CARBON	1.8K	5%	1/4W
R832	1-249-429-11	CARBON	10K	5%	1/4W
R833	1-249-429-11	CARBON	10K	5%	1/4W
R835	1-249-417-11	CARBON	1K	5%	1/4W
R845	1-249-416-11	CARBON	820	5%	1/4W
R852	1-249-417-11	CARBON	1K	5%	1/4W
R860	1-249-421-11	CARBON	2.2K	5%	1/4W
R861	1-249-421-11	CARBON	2.2K	5%	1/4W
R868	1-249-412-11	CARBON	390	5%	1/4W
R869	1-249-412-11	CARBON	390	5%	1/4W
R872	1-249-416-11	CARBON	820	5%	1/4W
R876	1-249-421-11	CARBON	2.2K	5%	1/4W
R877	1-249-426-11	CARBON	5.6K	5%	1/4W
R878	1-249-414-11	CARBON	560	5%	1/4W
R879	1-249-415-11	CARBON	680	5%	1/4W
R880	1-249-413-11	CARBON	470	5%	1/4W
R882	1-249-416-11	CARBON	820	5%	1/4W
R884	1-249-421-11	CARBON	2.2K	5%	1/4W
R886	1-249-418-11	CARBON	1.2K	5%	1/4W
R888	1-249-422-11	CARBON	2.7K	5%	1/4W
R889	1-249-417-11	CARBON	1K	5%	1/4W
R890	1-249-421-11	CARBON	2.2K	5%	1/4W
R891	1-249-429-11	CARBON	10K	5%	1/4W
R893	1-247-893-11	CARBON	390K	5%	1/4W

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YC-105

Ref. No.	Part No.	Description			Remark
*	A-6727-407-A	YC-105 BOARD, COMPLETE			
		**********			
		(Ref. No 2,000 Series)			
		< CAPACITOR >			
C001	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C006	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C007	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C008	1-163-031-00	CERAMIC CHIP	0.01uF	10%	50V
C009	1-124-907-11	ELECT	10uF	20%	50V
C010	1-124-907-11	ELECT	10uF	20%	50V
C011	1-124-907-11	ELECT	10uF	20%	50V
C012	1-124-126-00	ELECT	47uF	20%	10V
C013	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C014	1-124-907-11	ELECT	10uF	20%	50V
C015	1-124-126-00	ELECT	47uF	20%	10V
C016	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C018	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C020	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C021	1-124-903-11	ELECT	1uF	20%	50V
C022	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C023	1-124-903-11	ELECT	1uF	20%	50V
C024	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C025	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C026	1-163-125-00	CERAMIC CHIP	220PF	5%	50V
C027	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C028	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C029	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C032	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C034	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C035	1-163-123-00	CERAMIC CHIP	180PF	5%	50V
C036	1-124-499-11	ELECT, NONPOLAR	1uF	20%	50V
C038	1-163-139-00	CERAMIC CHIP	820PF	5%	50V
C039	1-163-091-00	CERAMIC CHIP	8PF		50V
C041	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C043	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C044	1-163-103-00	CERAMIC CHIP	27PF	5%	50V
C047	1-124-907-11	ELECT	10uF	20%	50V
C048	1-124-907-11	ELECT	10uF	20%	50V
C049	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C050	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C051	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C052	1-124-903-11	ELECT	1uF	20%	50V
C053	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C054	1-126-301-11	ELECT	1uF	20%	50V
C055	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C056	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C060	1-126-176-11	ELECT	220uF	20%	10V
C061	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C062	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C063	1-124-126-00	ELECT	47uF	20%	10V
C064	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C065	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C068	1-124-907-11	ELECT	10uF	20%	50V
C069	1-124-903-11	ELECT	1uF	20%	50V
C070	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C071	1-124-903-11	ELECT	1uF	20%	50V
C072	1-123-382-00	ELECT	3.3uF	20%	100V
C073	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C074	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C075	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C076	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C077	1-123-382-00	ELECT	3.3uF	20%	100V
C078	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C079	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C082	1-163-129-00	CERAMIC CHIP	330PF	5%	50V
C083	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C084	1-123-382-00	ELECT	3.3uF	20%	100V
C085	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
C086	1-163-109-00	CERAMIC CHIP	47PF	5%	50V
		< CONNECTOR >			
* CN001	1-563-258-11	SOCKET, CONNECTOR 15P			
* CN002	1-563-258-11	SOCKET, CONNECTOR 15P			
		< DIODE >			
D002	8-719-400-18	DIODE	MA152WK		
D003	8-719-400-18	DIODE	MA152WK		
D005	8-719-400-18	DIODE	MA152WK		
D006	8-719-400-18	DIODE	MA152WK		
D008	8-719-400-18	DIODE	MA152WK		
D010	8-719-400-18	DIODE	MA152WK		
D011	8-719-400-18	DIODE	MA152WK		
		< FILTER >			
FL001	1-239-152-11	FILTER, LOW PASS			
		< IC >			
IC001	8-759-824-14	IC	LA7383B		
IC002	8-752-334-61	IC	CXL5502P		
		< JUMPER RESISTOR >			
JR003	1-216-295-00	METAL CHIP	0	5%	1/10W
JR004	1-216-295-00	METAL CHIP	0	5%	1/10W
JR007	1-216-295-00	METAL CHIP	0	5%	1/10W
JR008	1-216-296-00	METAL CHIP	0	5%	1/8W
JR009	1-216-296-00	METAL CHIP	0	5%	1/8W

Ref.No.	Part No.	Description			Remark
JR010	1-216-296-00	METAL CHIP	0	5%	1/8W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR014	1-216-296-00	METAL CHIP	0	5%	1/8W
JR015	1-216-296-00	METAL CHIP	0	5%	1/8W
JR016	1-216-295-00	METAL CHIP	0	5%	1/10W
JR017	1-216-295-00	METAL CHIP	0	5%	1/10W
JR018	1-216-296-00	METAL CHIP	0	5%	1/8W
JR019	1-216-296-00	METAL CHIP	0	5%	1/8W
JR020	1-216-296-00	METAL CHIP	0	5%	1/8W
JR021	1-216-295-00	METAL CHIP	0	5%	1/10W
JR022	1-216-295-00	METAL CHIP	0	5%	1/10W
JR023	1-216-295-00	METAL CHIP	0	5%	1/10W
JR024	1-216-295-00	METAL CHIP	0	5%	1/10W
JR025	1-216-296-00	METAL CHIP	0	5%	1/8W
JR026	1-216-296-00	METAL CHIP	0	5%	1/8W
JR027	1-216-295-00	METAL CHIP	0	5%	1/10W
JR028	1-216-295-00	METAL CHIP	0	5%	1/10W
JR031	1-216-295-00	METAL CHIP	0	5%	1/10W
JR032	1-216-296-00	METAL CHIP	0	5%	1/8W
JR033	1-216-295-00	METAL CHIP	0	5%	1/10W
JR034	1-216-296-00	METAL CHIP	0	5%	1/8W
JR036	1-216-296-00	METAL CHIP	0	5%	1/8W
JR038	1-216-295-00	METAL CHIP	0	5%	1/10W
JR039	1-216-295-00	METAL CHIP	0	5%	1/10W
JR801	1-216-295-00	METAL CHIP	0	5%	1/10W
JR803	1-216-295-00	METAL CHIP	0	5%	1/10W
		< COIL >			
L003	1-410-524-41	INDUCTOR 180uH			
L004	1-410-645-31	INDUCTOR 100uH			
L005	1-410-645-31	INDUCTOR 100uH			
L007	1-410-439-11	INDUCTOR 470uH			
L008	1-410-437-11	INDUCTOR 330uH			
L011	1-408-421-00	INDUCTOR 100uH			
L012	1-408-421-00	INDUCTOR 100uH			
L015	1-410-516-11	INDUCTOR 39uH			
		< TRANSISTOR >			
Q001	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q002	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q009	8-729-901-06	TRANSISTOR	DTA144EK		
Q010	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q011	8-729-901-47	TRANSISTOR	DTA143EK		
Q013	8-729-216-22	TRANSISTOR	2SA1162-G		
Q014	8-729-900-XX	TRANSISTOR	DTA144WK		
Q016	8-729-901-01	TRANSISTOR	DTC144EK		
Q017	8-729-901-03	TRANSISTOR	DTC144WK		
Q021	8-729-100-66	TRANSISTOR	2SC1623-L6		

Ref.No.	Part No.	Description			Remark
Q022	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q023	8-729-216-22	TRANSISTOR	2SA1162-G		
Q024	8-729-216-22	TRANSISTOR	2SA1162-G		
Q025	8-729-901-01	TRANSISTOR	DTC144EK		
Q026	8-729-216-22	TRANSISTOR	2SA1162-G		
Q028	8-729-100-66	TRANSISTOR	2SC1623-L6		
Q031	8-729-901-01	TRANSISTOR	DTC144EK		
Q032	8-729-901-06	TRANSISTOR	DTA144EK		
Q034	8-729-216-22	TRANSISTOR	2SA1162-G		
Q035	8-729-216-22	TRANSISTOR	2SA1162-G		
		< RESISTOR >			
R001	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R003	1-216-049-00	METAL CHIP	1K	5%	1/10W
R004	1-216-047-00	METAL CHIP	820	5%	1/10W
R005	1-216-036-00	METAL CHIP	300	5%	1/10W
R006	1-216-085-00	METAL CHIP	33K	5%	1/10W
R007	1-216-085-00	METAL CHIP	33K	5%	1/10W
R008	1-216-049-00	METAL CHIP	1K	5%	1/10W
R009	1-216-025-00	METAL CHIP	100	5%	1/10W
R011	1-216-075-00	METAL CHIP	12K	5%	1/10W
R014	1-216-049-00	METAL CHIP	1K	5%	1/10W
R017	1-216-047-00	METAL CHIP	820	5%	1/10W
R018	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R019	1-216-085-00	METAL CHIP	33K	5%	1/10W
R020	1-216-073-00	METAL CHIP	10K	5%	1/10W
R021	1-216-049-00	METAL CHIP	1K	5%	1/10W
R022	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R023	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R026	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R027	1-216-295-00	METAL CHIP	0	5%	1/10W
R029	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R031	1-216-204-00	METAL GLAZE	1.8K	5%	1/8W
R032	1-216-052-00	METAL CHIP	1.3K	5%	1/10W
R033	1-216-036-00	METAL CHIP	300	5%	1/10W
R034	1-216-295-00	METAL CHIP	0	5%	1/10W
R036	1-216-295-00	METAL CHIP	0	5%	1/10W
R039	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R040	1-216-198-00	METAL CHIP	1K	5%	1/8W
R041	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R042	1-216-121-00	METAL CHIP	1M	5%	1/10W
R043	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R045	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R046	1-216-049-00	METAL CHIP	1K	5%	1/10W
R047	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R049	1-216-049-00	METAL CHIP	1K	5%	1/10W
R050	1-216-043-00	METAL CHIP	560	5%	1/10W
R051	1-216-043-00	METAL CHIP	560	5%	1/10W
R052	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R053	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R054	1-216-049-00	METAL CHIP	1K	5%	1/10W
R055	1-216-043-00	METAL CHIP	560	5%	1/10W
R056	1-216-089-00	METAL CHIP	47K	5%	1/10W
R057	1-216-085-00	METAL CHIP	33K	5%	1/10W
R058	1-216-121-00	METAL CHIP	1M	5%	1/10W
R059	1-216-049-00	METAL CHIP	1K	5%	1/10W
R060	1-216-095-00	METAL CHIP	82K	5%	1/10W
R066	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R067	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R068	1-216-073-00	METAL CHIP	10K	5%	1/10W
R071	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R072	1-216-049-00	METAL CHIP	1K	5%	1/10W
R073	1-216-081-00	METAL CHIP	22K	5%	1/10W
		< VARIABLE RESISTOR >			
RV002	1-241-080-11	RES, ADJ, CARBON 10K			
RV003	1-241-080-11	RES, ADJ, CARBON 10K			
RV004	1-241-080-11	RES, ADJ, CARBON 10K			
RV005	1-241-079-11	RES, ADJ, CARBON 4.7K			
RV006	1-241-076-11	RES, ADJ, CARBON 1K			
RV007	1-241-076-11	RES, ADJ, CARBON 1K			
RV008	1-241-077-11	RES, ADJ, CARBON 2.2K			
		< VIBRATOR >			
X001	1-577-380-11	VIBRATOR, CRYSTAL (3.58MHz)			

****

		MISCELLANEOUS	
		**********	
2	1-466-652-11	SWITCH BLOCK, CONTROL	
* 69	1-555-110-11	CABLE, PIN	
210	1-543-647-11	HEAD, FE	
239	8-848-543-01	UPPER DRUM ASSY (DZR-25-R)	
256	1-692-062-11	SWITCH, ROTARY	
D001	8-719-985-00	DIODE GL451VS1	
M901	8-848-541-11	DRUM ASSY (DZH-25A-R)	
M902	8-835-389-03	MOTOR, DC U-26D (CAPSTAN)	
M903	X-3733-302-1	MOTOR ASSY, CAM	
M904	X-3727-784-1	MOTOR ASSY (LOADING)	
Q001	8-729-926-31	PHOTO TRANSISTOR PT483FIS	
Q002	8-729-926-31	PHOTO TRANSISTOR PT483FIS	

****

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-417-139-11	MATCHING TRANSFORMER, ANTENNA	
	1-465-961-11	REMOTE COMMANDER (RMT-V102C)	
	1-558-076-41	CORD, CONNECTION	
	1-569-008-11	ADAPTER, CONVERSION 2P	
⚠	1-574-085-11	CORD, POWER (US, CND)	
⚠	1-575-131-11	CORD, POWER (PX)	
*	3-741-959-11	CUSHION (UPPER)	
*	3-741-960-01	CUSHION (LOWER)	
	3-754-112-21	MANUAL, INSTRUCTION (ENGLISH)	
	3-754-112-31	MANUAL, INSTRUCTION (FRENCH) (CND)	
*	3-947-234-01	INDIVIDUAL CARTON	

****

HARDWARE LIST

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 IT-3
#3	7-685-648-79	SCREW +BVTP 3X12 TYPE2 IT-3
#4	7-628-254-00	SCREW +PS 2.6X5
#5	7-682-548-04	SCREW +P 3X8
#6	7-621-732-08	SET-SCT, HEX. 2X3 FLAT POINT
#7	7-627-552-08	SCREW, PRECISION +P 1.7X2.5
#8	7-682-547-04	SCREW +P 3X6
#9	7-682-645-01	SCREW +PS 3X4

****

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

SECTION 7
MECHANICAL ADJUSTMENTS

Refer to "VHS MECHANICAL ADJUSTMENT MANUAL II" separately issued for MECHANICAL ADJUSTMENTS.

[PERIODIC CHECK AND REPLACEMENT]

In order to obtain the best performance from this unit and make full use of its capabilities, and to extend the life of the unit and tapes, it is recommended that the following periodic checks and maintenance be performed.

* The following must be done after every repair regardless of how many hours the user has operated the machine.

7-1. CLEANING OF ROTATING HEAD DISK ASSEMBLY

1) Press a chamois cloth (Jig Ref. No. J-9) which has been dipped in cleaning fluid (Jig Ref. No. J-8) lightly against the rotating drum assembly, then do the cleaning by slowly rotating the rotating head disk by hand. (Never try to clean by using the motor to turn it.)
2) Never try to clean by moving the chamois cloth at a vertical angle to the head tip. There is a very great danger of damaging the head tip if this is done.

7-2. CLEANING OF THE TAPE MOVEMENT SYSTEM

1) Clean the surfaces which the tape contacts during its movement (tape guide, drum assembly surface, capstan, pinch roller, etc.) with a chamois cloth that has been dipped in cleaning fluid.

7-3. CLEANING THE DRIVE SYSTEM

1) Clean the driving parts with a cloth that has been dipped cleaning fluid.

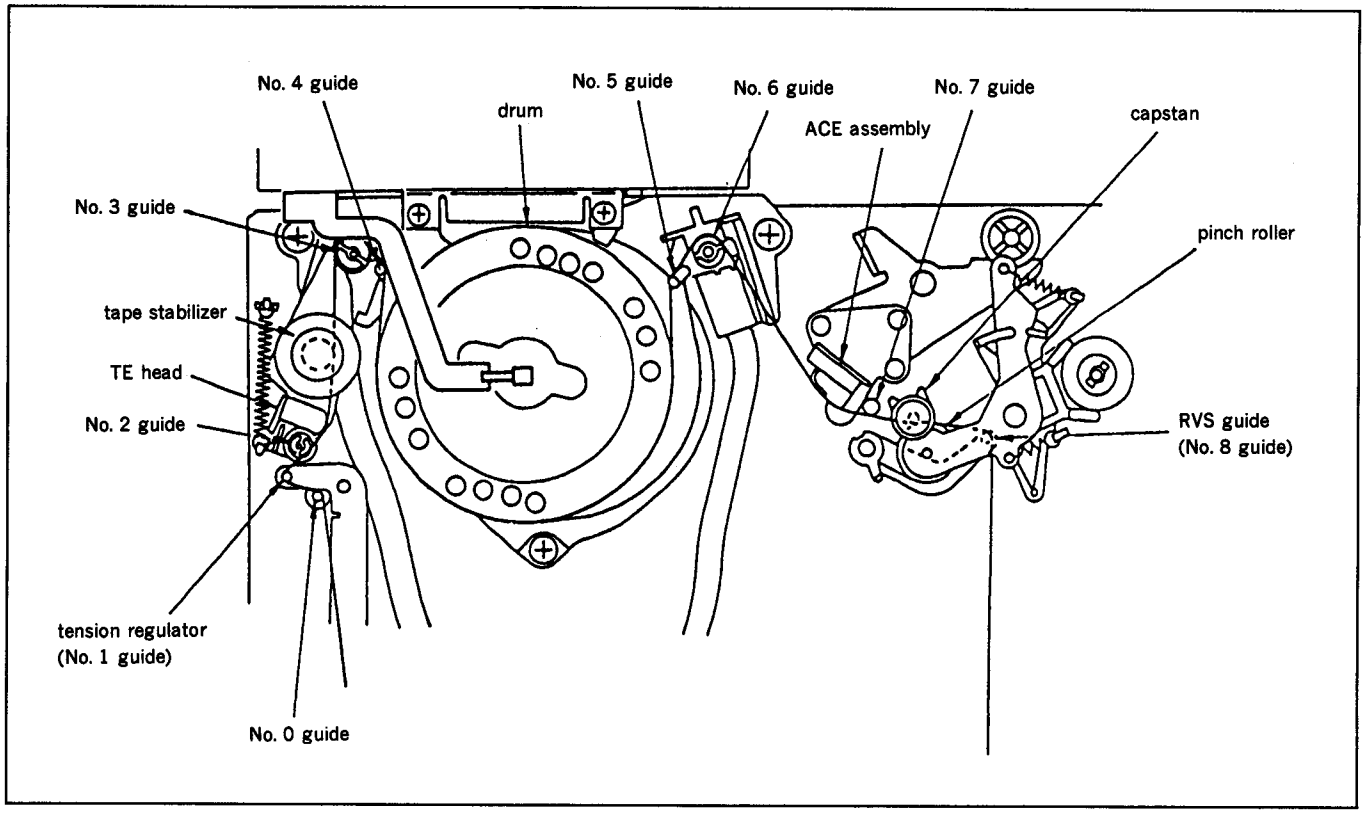


Fig. 7-1. Parts requiring cleaning

7-4. PERIODIC CHECK ITEMS

Perform the maintenance and check listed on the table below, according to users operating hours.

	Maintenance & Check	Replacement Part No.	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	Remarks
		Operating Hours (H)											
Tape Transportation System	Cleaning of tape transportation system		○	○	○	○	○	○	○	○	○	○	This cleaning must be done whenever a repair is made.
	Cleaning & degaussing of ACE ass'y	A-6761-129-C	○	○	○	○	○	○	○	○	○	○	
	Cleaning & degaussing of video disk ass'y		○	○	○	○	○	○	○	○	○	○	The life of the head varies, depending on operational conditions and method.
Driving System	Timing belt	3-736-013-01	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	This cleaning must be done whenever a repair is made.
Performance Confirmation	Abnormal sound		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust or replace the section whitch causes abnormal sound.
	Measurement of FWD back tention		—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to "VHS MECHANICAL ADJUSTMENT MANUAL II" item 4-1-1. Specified value : adjust to 30 to 42g•cm (when measured with torque cassette tape)
	Confirmation of brake system		—	☆	—	☆	—	☆	—	☆	—	☆	Confirmation must be made according to section.
	Confirmation of record & playback functions		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Perform the confirmation whenever repair is made.
	Measurement of forward torque		☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	Adjust to 80−170g•cm

○ Cleaning ☆ Confirmation

Note : On overhaul
When overhauling the unit, replace parts as indicated in the above table.

SECTION 8
ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 142 for the adjustment.

8-1. PREPARATION FOR ADJUSTMENT

Necessary items and indications for total adjustment of electric circuit of this machine will be described in this chapter.

8-1-1. Equipment Required

1) Color TV
2) Oscilloscope 1 or 2 phenomera, band 30MHz min, delay mode, as provided.
3) Frequency counter (min. 8 digits)
4) NTSC pattern generator
5) Digital voltmeter
6) Audio level meter
7) Audio generator
8) Attenuator
9) Distortion factor meter
10) Alignment tape
    Part Code : H7099046H (MH-1)

8-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown is the following diagram.

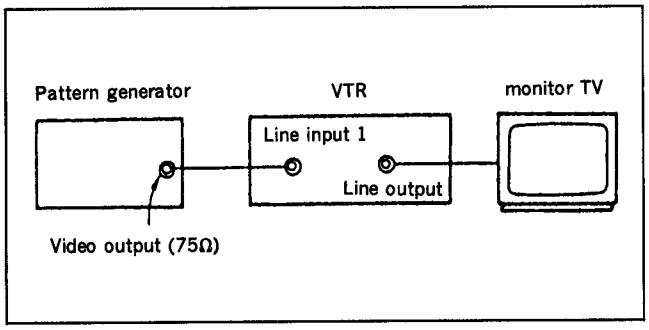


Fig. 8-1.

8-1-3. Input Signal Check

In this adjustment, NTSC pattern generator is connected with LINE 1 input signal terminal. When check to tuner, connected VHF antenna terminal. Check that the amplitudes of video signal SYNC signal, of picture portions, and of burst signals are flat at approximately 0.3, 0.7 and 0.3V, respectively, and that the level ratio of the burst signal and "red" signal are 0.30 : 0.66. Fig. 8-2. shows video signals (color bars) used in adjusting the video section.

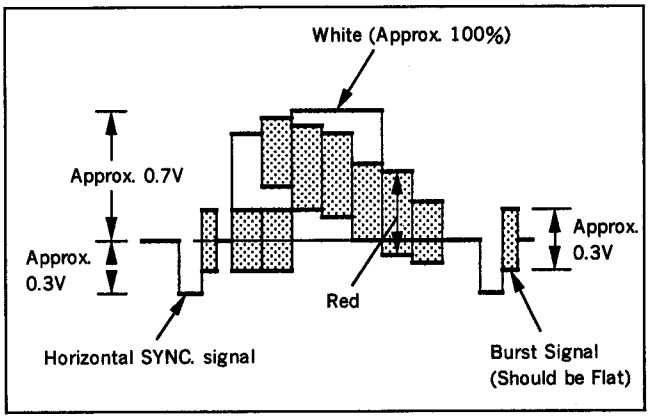


Fig. 8-2.

8-1-4. Alignment tape (MH-1)

	Mode	Time	Video signal	Audio signal
1	SP	10minutes	Stair-step	7kHz
2		5minutes	—	3kHz
3		10minutes	Color bar	1kHz
4		3minutes	RF sweep	—

8-1-5. Input/Output Level and Impedance

Input/output terminal

Video inputs — LINE IN 1 and 2 : phono jacks
1Vp-p, 75ohms, unbalanced, sync negative

Audio inputs — LINE IN 1 and 2 : phono jacks
−7.5dBs (0dBs=0.775Vrms), more than 47kilohms

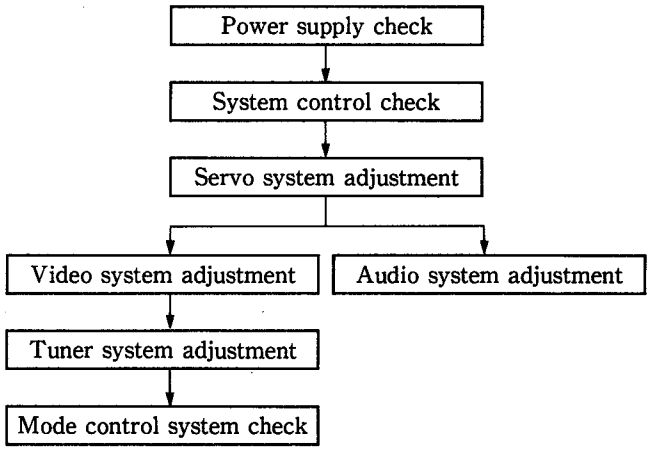
Video outputs — LINE OUT : phono jack
1Vp-p, 75ohms, unbalanced, sync negative

Audio outputs — LINE OUT : phono jack
−7.5dBs at load impedance 47kilohms
Output impedance : less than 10kilohms

CONTROL S IN Minijack (1)

8-1-6. Adjusting Sequence

Make the electrical adjustment in the following sequence.



8-2. POWER SUPPLY CHECK (POWER SUPPLY BOARD)

Mode	E-E
Measuring instrument	Digital voltmeter
SWD 12V check	
Measurement point	CN711 pin ② and ③
Specified value	12.3±0.3Vdc
UNSWD 12V check	
Measurement point	CN711 pin ⑥
Specified value	12.0±0.3Vdc
SWD 5V check	
Measurement point	CN711 pin ⑨
Specified value	5.1±0.1Vdc
SWD 9V check	
Measurement point	CN711 pin ⑦
Specified value	9.0±0.3Vdc
UNSWD 5.8V check	
Measurement point	CN711 pin ⑧
Specified value	5.9±0.25Vdc
UNSWD 17V check	
Measurement point	CN711 pin ①
Specified value	18±2.0Vdc
UNSWD 43V check	
Measurement point	CN711 pin ⑮
Specified value	43±3.0Vdc
UNSWD −30V check	
Measurement point	CN711 pin ⑱
Specified value	−27.5±2.5Vdc
UNSWD 3.6V check	
Measurement point	Between CN711 pin ⑰ and pin ⑯
Specified value	3.6±0.3Vdc

[Checking Method]

1) Confirm that each voltage satisfies its specified value.

POWER SUPPLY BOARD (conductor side)

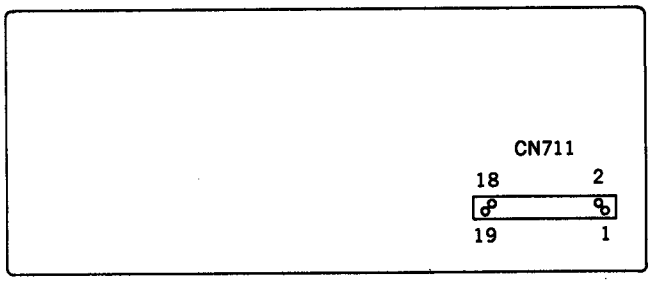


Fig. 8-3.

8-3. SYSTEM CONTROL CHECK

8-3-1. Clock Oscillation Frequency Check (MA-44 Board)

Mode	E-E
Signal	None
Measurement point	IC601 pin ㉘
Measuring instrument	Frequency counter
Specified value	14318180±100Hz

Note : Connect a 10kΩ resistor (1-249-429-11) to the frequency counter.

[Checking Method]

1) Confirm that the frequency at the IC601 pin ㉘ is 14318180±100Hz.

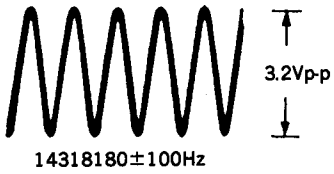


Fig. 8-4.

8-3-2. OSD Adjustment (CT-32 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC685 pin ⑧
Measuring instrument	Frequency counter
Adjustment element	RV685
Specified value	15734±300Hz

Note : Connect the frequency counter through a baffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

[Connection]

1) Pull up IC685 pin ① to +5V with a 1kΩ resistor (1-249-417-11).

[Adjustment Method]

1) Adjust RV685 so that the reading on the frequency counter becomes within 15734±300Hz.

Fig. 8-5.

8-4. SERVO SYSTEM ADJUSTMENT

8-4-1. Switching Position Adjustment (MA-44 Board)

Mode	PB
Signal	Alignment tape SP stair-step
Measurement point	CH1 : CN005 pin ⑧ (VIDEO) CH2 : CN005 pin ⑥ (RF SWP)
Measuring instrument	Oscilloscope
Adjustment element	RV501
Specified value	6.5±0.5H (410±30μsec)

[Adjustment Method]

1) Press the TRACKING buttons ▲ and ▼ at the same time so that the tracking condition is the center position.
2) Adjust to 6.5±0.5H (410±30μsec) with RV501.

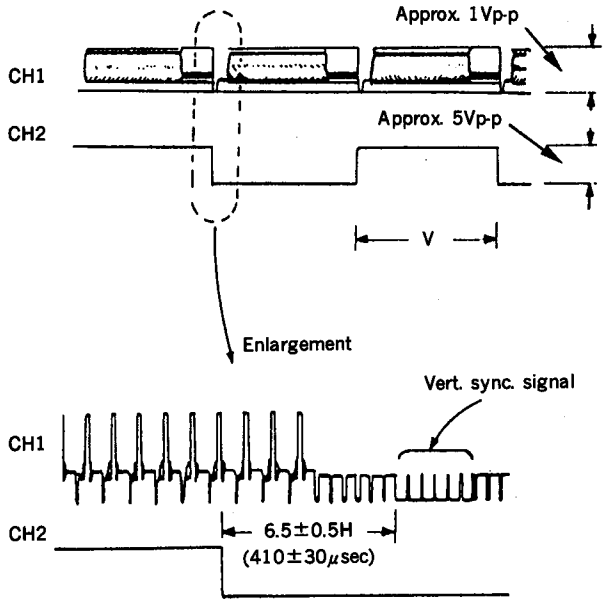


Fig. 8-6.

Make sure that sync. and color burst signals meet requirements

8-5-6. White Clip, Dark Clip Check (YC-105 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC001 pin ④
Measuring instrument	Oscilloscope
Specified value	White clip: 175−200% Dark clip: 40±10%

[Checking Method]

1) Check that white and dark clip level meet the specified values, when the heigh from sync to white level is 100%.

Fig. 8-12.

8-5-7. Recording Y Signal Level Check (YC-105 Board)

Mode	E-E
Signal	None
Measurement point	CN001 pin ①
Measuring instrument	Oscilloscope
Specified value	330±50mVp-p

[Checking Method]

1) Confirm that the amplitude level on oscilloscope is within 330±50mVp-p.

Fig. 8-13.

8-5-8. Recording Chroma Level Adjustment (YC-105 Board)

Mode	E-E
Signal	Color bar
Measurement point	CN002 pin ⑧
Measuring instrument	Oscilloscope
Adjustment element	RV008
Specified value	100±10mVp-p

[Adjustment Method]

1) Adjust to the specified value with RV008.

Fig. 8-14.

8-6. AUDIO SYSTEM ADJUSTMENT

- Adjust the audio system in the SP mode, unless otherwise specified.
  Use the alignment tape.

[Connection]

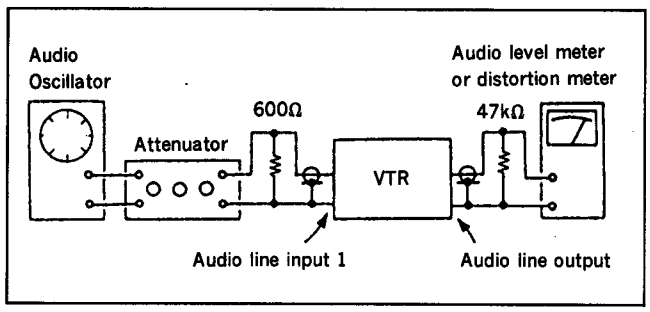


Fig. 8-15.

- Make adjustment in the SP mode, unless otherwise specified.
  Use a normal VHS cassette for an adjustment tape.
- Make adjustment with the switches set to the following positions:
  INPUT SELECT .... LINE 1

[Adjustment Method]

8-6-1. ACE Head Adjustment .... See "VHS MECHANICAL ADJUSTMENT MANUAL II".
8-6-2. E-E Output Level Check
8-6-3. Recording Bias Adjustment
8-6-4. Overall Level Characteristic and Distortion Factor Check
8-6-5. Overall S/N Check

8-6-1. ACE Head Adjustment See "VHS MECHANICAL ADJUSTMENT MANUAL II"

8-6-2. E-E Output Level Check

Mode	E-E
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	−7.5±2dBs

[Checking Method]

1) Input a signal of 400Hz, −7.5dBs to Audio Line Input.
2) Confirm that the audio output level is −7.5±2dBs.

8-6-3. Recording Bias Adjustment (AU-90 Board)

Mode	REC and PB
Signal	400Hz, −27.5dBs 7kHz, −27.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Adjustment element	RV201
Specified value	0±1dB

[Adjustment Method]

1) Supply a signal of 400Hz, −27.5dBs to Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate −27.5dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7kHz and make recording.
6) Play back a recorded portion, and measure output levels at 400Hz and 7kHz.
7) Confirm that the 7kHz playback output level is within a range of 0±1dB to the 400Hz playback output level. When it is out of this range, adjust RV201 and repeat the step 1) through 7) above.

8-6-4. Overall Level Characteristic and Distortion Factor Check

Mode	REC and PB
Signal	400Hz, −7.5dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter and distortion factor meter
Specified value	Playback level: −7.5±2dBs Distortion factor: 4% or less

[Confirmation Method]

1) Supply an audio signal of 400Hz, −7.5dBs Audio Line Input.
2) Make recording.
3) Play back a recorded portion.
4) Confirm that a playback level is −7.5±2dBs.
5) Confirm that a distortion factor is within 4%.

8-6-5. Overall S/N Check

Mode	REC and PB
Signal	400Hz, −7.5dBs, and no signal
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	35dB or more

[Confirmation Method]

1) Supply a signal of 400Hz to Audio Line Input. Adjust the attenuator so that the audio line output level will be −7.5dBs.
2) Make recording.
3) With the REC mode held, make the no-signal state. (Short an input).
4) Play back a recorded portion, and confirm that there is a level difference of 35dB or more between 400Hz portion and no-signal portion (immediately after a 400Hz signal).

8-7. TUNER SYSTEM ADJUSTMENT

8-7-1. RF AGC Adjustment (IF701 Unit/MA-44 Board)

Mode	E-E
Signal	Broadcasting TV signal
Adjustment element	VR of IF701 unit (Fig. 8-16.)

[Adjustment Method]

1) Adjust monitor TV to its maximum contrast and receive broadcasting TV signal.
2) Turn the VR so that snow noise becomes appear.
3) Turn the VR inverse direction and set it at a position where snow noise disappears.
4) Receive each channel and confirm that there are no beat, picture distortion and snow noise due to inter modulation.

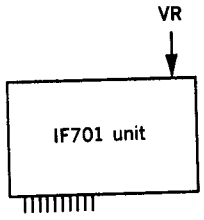


Fig. 8-16.

8-8. MODE CONTROL SYSTEM CHECK

8-8-1. Clock Check (MF-149 Board)

Mode	E-E
Signal	Color bar
Measurement point	IC001 pin ⑥① (POWER FAIL) IC001 pin ③⓪ (TX)
Measuring instrument	Frequency counter
Specified value	IC001 pin ⑥①: 2097152±10000Hz IC001 pin ③⓪: 32768±2Hz

Note : Connect the frequency counter through a buffer amplifier (Oscilloscope, etc.) having high impedance and low capacitance.

[Connection]

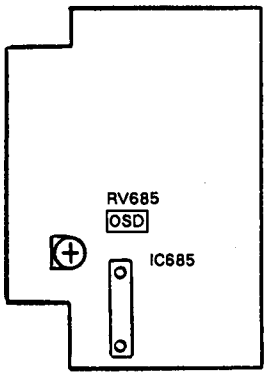
1) Connect IC001 ③② ($\overline{\text{RESET}}$) and ⑥⓪ (VC PWM) pins to GND.

[Checking Method]

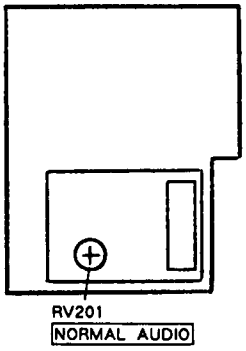
1) Confirm that the reading on the frequency counter at pin ⑥① is 2097152±10000Hz.
2) Confirm that the reading on the frequency counter at pin ③⓪ is 32768±2Hz.
3) After adjustment, remove the connection.

8-9. ADJUSTING PART LOCATION DIAGRAMS

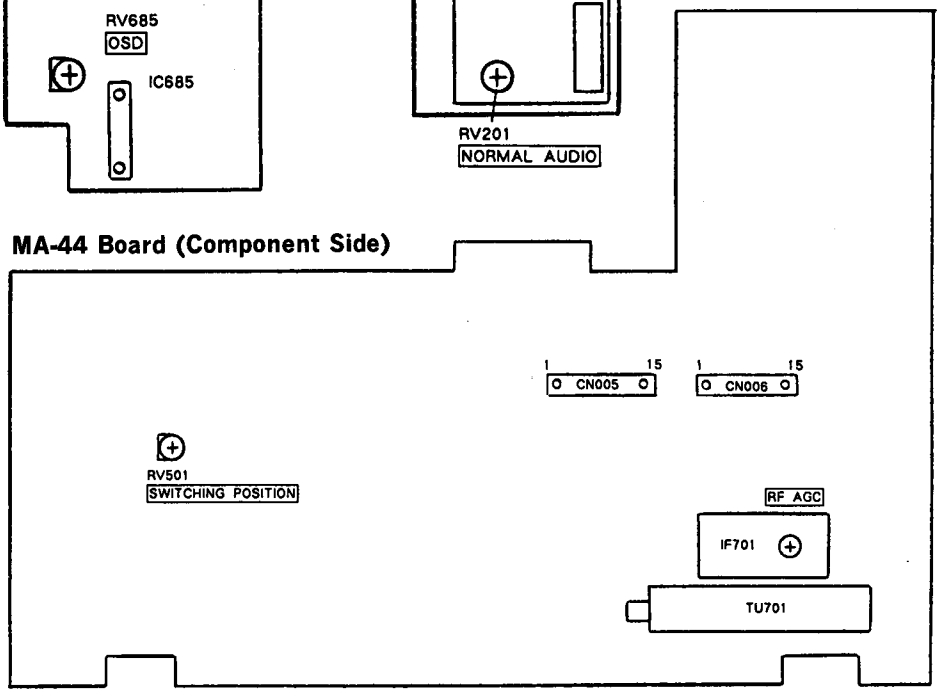
CT-32 Board (Component Side)



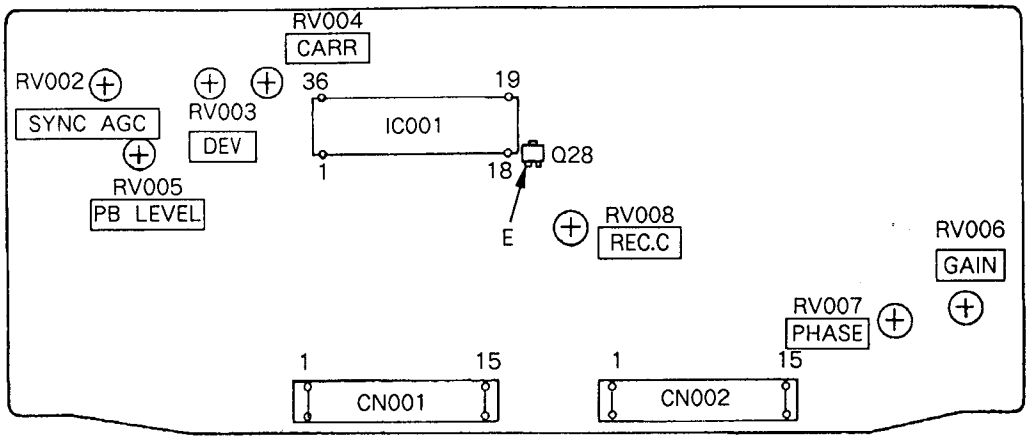
AU-90 Board (Component Side)



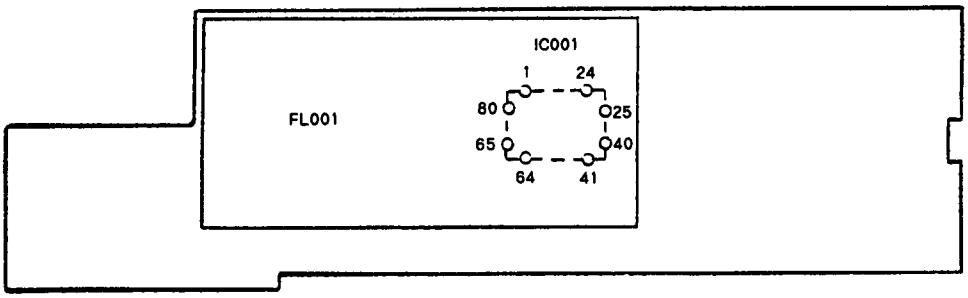
MA-44 Board (Component Side)



YC-105 Board (Conductor Side)



MF-150 Board (Component Side)



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